

FC3600

CUTTING MACHINE

USER'S MANUAL

MANUAL NO. FC3600-UM-151



GRAPHTEC

PREFACE

Thank you for purchasing the FC3600 Cutting Plotter.

To ensure optimum use of its various functions, be sure to read this manual thoroughly before use.

■ Notes on the Use of This Manual

- All rights reserved. No part of this publication may be reproduced, stored in a retrieval system, or transmitted, in any form or by any means, without the prior written permission of Graphtec Corporation.
- The specifications and other information in this manual are subject to change without notice.
- While every effort has been made to supply complete and accurate information about this product, please address any inquiries about unclear information, possible errors, or other comments to your sales representative or nearest Graphtec vendor.
- Notwithstanding the preceding paragraph, Graphtec Corporation assumes no liability for damages resulting from the use of the information contained herein or of the product.

■ Registered Trademarks and Copyrights

- The names of products and brands mentioned herein are the registered trademarks or trademarks of their respective companies.
- All copyrights regarding this manual belong to Graphtec Corporation.

TO ENSURE SAFE AND CORRECT USE

- To ensure safe and correct use of your plotter, read this Manual thoroughly before use.
- After having read this Manual, keep it in a handy location for quick reference as needed.
- Do not permit small children to touch the plotter.
- The following describes important points for safe operation. Please be sure to observe them strictly.

Conventions Used in This Manual

To promote safe and accurate use of the plotter as well as to prevent human injury and property damage, safety precautions provided in this manual are ranked into the three categories described below. Be sure you understand the difference between each of the categories.



DANGER

: This category provides information that, if ignored, is highly likely to cause fatal or serious injury to the operator.



WARNING

: This category provides information that, if ignored, is likely to cause fatal or serious injury to the operator.



CAUTION

: This category provides information that, if ignored, could cause injury to the operator or physical damage to the plotter.

Description of Safety Symbols



The \triangle symbol indicates information that requires careful attention (which includes warnings). The point requiring attention is described by an illustration or text within or next to the \triangle symbol.



The \bigcirc symbol indicates action that is prohibited. Such prohibited action is described by an illustration or text within or next to the \bigcirc symbol.



The \bullet symbol indicates action that must be performed. Such imperative action is described by an illustration or text within or next to the \bullet symbol.

Safety Precautions

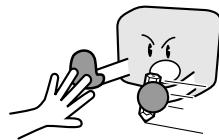
WARNING

During a plotting or cutting operation, do not touch the writing panel, carriage, and other moving parts.

- Such action may cause human injury.



No touching

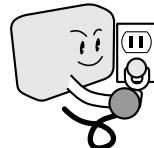


Be sure that the plotter is grounded.

- If the plotter is not grounded, the operator could suffer an electrical shock in case of current leakage.



Ground the Plotter



Even when the plotter is stopped, it may suddenly start operating if it receives data, so be sure to keep your hands, hair, and so forth away from the vicinity of the plotter's writing panel and moving parts such as the pen carriage.

- Such action may cause human injury.



Keep away



Do not disassemble, repair, or remodel the plotter.

- Such action may cause electrical shock or a fire hazard due to current leakage.
- Contact with the high-voltage parts within the plotter may cause electrical shock.
- If the plotter requires repair, contact your sales representative or nearest Graphtec vendor.



No disassembly



Do not connect the plotter to a non-rated power supply.

- Use of a different supply voltage may result in electrical shock or a fire hazard due to current leakage.



Use prohibited

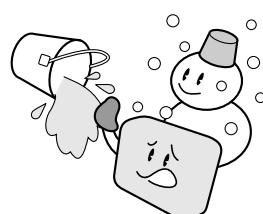


Do not use the plotter in a location where it will be exposed to water, rain or snow.

- Such location may cause electrical shock or a fire hazard due to current leakage.



Avoid water



Beware of electrical shock

Safety Precautions (Continued)

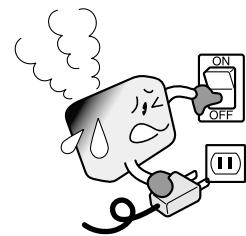
⚠ WARNING

If the plotter generates smoke, is too hot, emits a strange odor, or otherwise functions abnormally, do not continue using it. Turn off its power and unplug its power cable from the electrical socket.

- Use of the plotter in such status may result in a fire hazard or electrical shock.
- After confirming that smoke is no longer being generated, contact your sales representative or nearest Graphtec vendor to request repair.
- Never try to perform repair yourself. Repair work by inexperienced personnel is extremely dangerous.



Prohibited

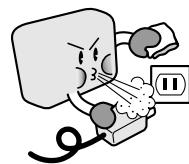


Do not allow dust or metallic matter to adhere to the power plug.

- A dirty power plug may result in electrical shock or a fire hazard due to current leakage.



Prohibited



Beware of
electrical shock

Do not use the power cable if it is damaged.

- Use of a damaged cable may result in electrical shock or a fire hazard due to current leakage.
- Replace the power cable with a new one.



Unplug
the power cable
from the socket



Avoid direct contact with the cutter blade.

- Touching the blade with your bare hand may cause injury.
- During a cutting operation, keep away from the cutter blade.



Avoid contact



Safety Precautions (Continued)

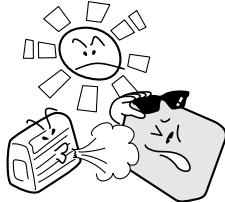
⚠ CAUTION

Do not use or store the plotter in a location exposed to direct sunlight or the direct draft of an air conditioner or heater.

- Such location may impair the performance of the plotter.



Prohibited

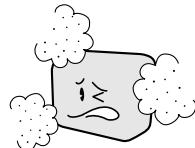


Do not use or store the plotter in an excessively dusty or humid location.

- Such locations may impair the performance of the cutting plotter.



Prohibited



Do not place any receptacle containing water or other fluid on top of the plotter.

- Fluid falling inside the plotter may cause electrical shock or a fire hazard due to current leakage.



Avoid water



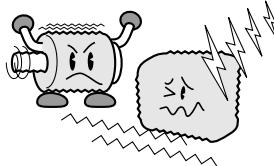
Beware of
electrical shock

Do not install, use, or store the plotter in a location subject to excessive mechanical vibration or electrical noise.

- Such location may impair the performance of the plotter.



Prohibited

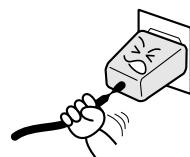


When disconnecting the power cable or an interface cable, do not pull on the cable.

- Such action will damage the cable, resulting in a fire hazard or electrical shock. Be sure to hold the power cable's plug or the interface cable's connector.



Prohibited

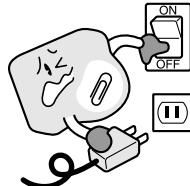


If water or foreign matter enters inside the plotter, do not continue using it. Turn off its power and unplug its power cable from the electrical socket.

- Use of the plotter in such status may result in electrical shock or a fire hazard due to current leakage.
- Contact your sales representative or nearest Graphtec vendor to request repair.



Unplug
the power cable
from the socket



Safety Precautions (Continued)

CAUTION

Do not attempt to lubricate the plotter's mechanisms.

- Such action may cause it to break down.



Prohibited



Do not clean the plotter using a volatile solvent (such as thinner or benzine).

- Such action may impair its performance.



Prohibited

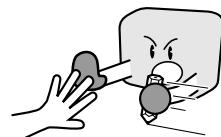


During a cutting or plotting operation, ensure that the movement of the media is not impeded by contact with objects in the plotter's vicinity.

- Such contact could cause misalignment of the cut or plotted results.



No contact



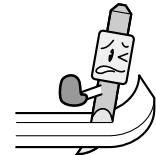
When using indoor illumination such as a fluorescent lamp or a floor lamp, be sure such illumination is positioned at least one meter away from the plotter.

- Insufficient distance may cause the sensors to malfunction and prevent correct detection of the loaded medium.



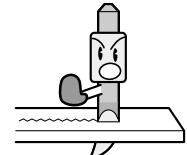
If an edge of the loaded medium comes loose, secure it with drafting tape or a similar means.

- The cutter's blade will break if its tip gets caught on a loose edge of the medium.



When using the cutter, beware not to extend the cutter's blade excessively.

- An excessive blade length will damage the cutting mat and impair the plotter's cutting quality.



WARNING

The United States Federal Communications Commission has specified that the following notice must be brought to the attention of users of this product.

FEDERAL COMMUNICATIONS COMMISSION RADIO FREQUENCY INTERFERENCE STATEMENT

NOTE: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

USE SHIELDED CABLES

To comply with FCC Class A requirements, all external data interface cables and connectors must be properly shielded and grounded. Proper cables and connectors are available from GRAPHTEC's authorized dealers or manufacturers of computers or peripherals. GRAPHTEC is not responsible for any interference caused by using cables and connectors other than those recommended or by unauthorized changes or modifications to this equipment. Unauthorized changes or modifications could void the user's authority to operate the equipment.

SELECTING A POWER CABLE

Be sure to refer to the following tables if you wish to use a cable other than the one supplied as an accessory.

Table 1 100 V to 120 V Power Supply Voltage Range

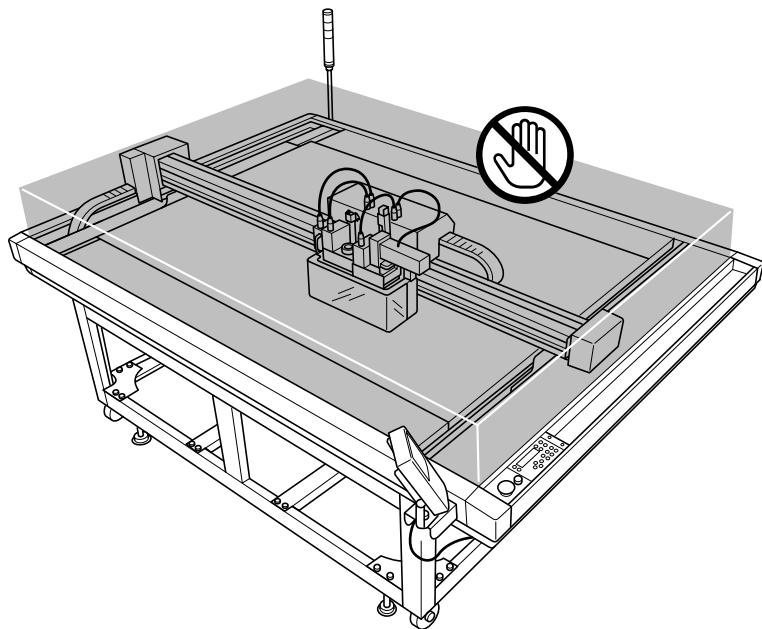
Plug Configuration	Plug Type	Supply Voltage Selector Settings	Reference Standards	Power Cable
	North America 125 V 10A	100/120 V	ANSI C73.11 NEMA 5-15 UL498/817/62 CSA22.2 NO.42/21/49	UL Listed Type SJT No. 18AWG x 3 300 V, 10 A

Table 2 200 V to 240 V Power Supply Voltage Range

Plug Configuration	Plug Type	Supply Voltage Selector Settings	Reference Standards	Power Cable
	Europe 250 V 10 A	200 V	CEE(7)VII IEC320 CEE13	TYPE: H05VV-F 3 x 1.0 mm ²
	UK 250 V 5 A	200 V	BS1363 BS4491 BS6500	TYPE: H05VV-F 3 x 1.0 mm ²
	Australia 250 V 10 A	200 V	AS3112 AS3109 AS3191	TYPE: OD3CFC 3 x 1.0 mm ²
	North America 250 V 15 A	200 V	ANSI C73.20 NEMA 6-15 UL 198.6	UL Listed Type SJT No.18AWG x 3 300 V, 10 A
	Switzerland 250 V 6 A	200 V	SEV1011 SEV1004 SEV1012	TYPE: H05VV-F 3 x 0.75 mm ²

CAUTION – AFTER TURNING THE UNIT ON

The FC3600 poses a risk of injury when turned on, so be sure to keep your hands, hair, clothing, and the like away from the Y bar, tool head (pen block area and tangential heads), and moving parts. Do not place foreign objects in these areas.



WARNING AND CAUTION LABELS

Labels on the FC3600 indicate warnings and cautions. Improper operations resulting from failure to heed the warnings and cautions on the labels are dangerous and may damage the FC3600, so be sure to operate the FC3600 in compliance with the labels.

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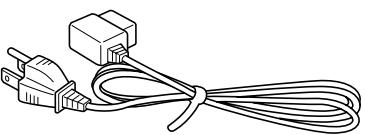
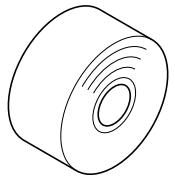
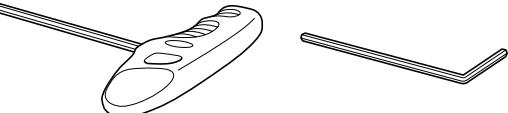
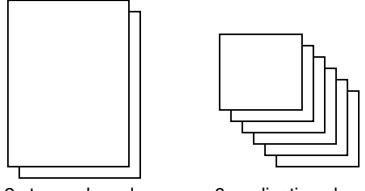
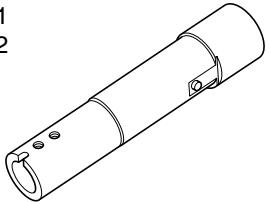
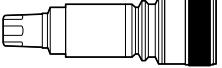
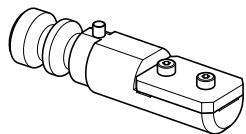
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1.1 Checking the Standard Accessories

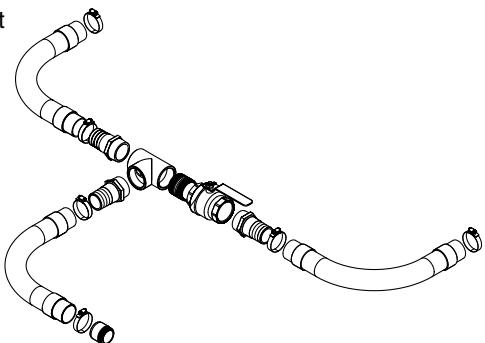
Refer to the following list of accessories and check to confirm that all are present. If any accessory is missing, contact your sales representative or nearest Graphtec vendor.

■ Standard Accessories

Power cable 1 	User's manual 1 
CD-ROM (includes drivers, applications and other related materials) 1 	Clear packaging tape 1 
Spacer (for adjusting the pen block height) 1 	Wrenches 1 each  T hex wrench (2.5 mm) L hex wrench (2 mm)
Cutting Mats 1 set each 2 styrene boards 6 application sheets 	Tool holder T/O type : 1 TT/OT type : 2 
Water-based fiber-tip pen 1 	Replacement blades (XB57) 1 box 
Blade holder (BHD-XB57) T/O type : 1 TT/OT type : 2 	Vacuum pump hose connection kit (PPK001) 1 set (See page 1-3 for details)

Vacuum pump hose connection kit (PPK001)

1 set



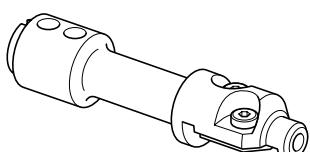
The vacuum pump hose connection kit is used to connect the vacuum pump to the FC3600's vacuum suction unit when the FC3600 is installed.

■ O/OT-Type Accessories

The following accessories are provided for the O/OT type only. Check to confirm that all are present. If any accessory is missing, contact your sales representative or nearest Graphtec vendor.

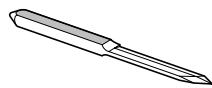
Blade holder (BHD-OS20)

1



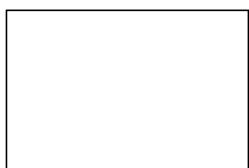
Replacement blades (CB3OU-OS20)

1 box



Cutting mat (felt)

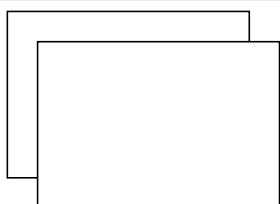
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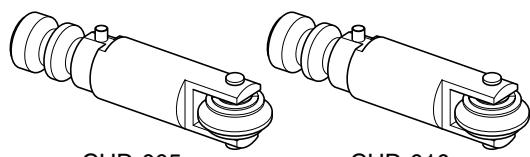
■ Options and Supplies

A variety of optional parts are available for purchase as required. See "Appendix B Options and Supplies" for other optional parts.

Cutting mats (felt and PP board)



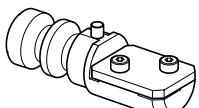
Creasing tools



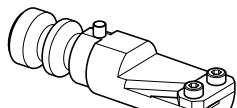
CHD-005

CHD-010

Blade holders (for use with the tool holder)

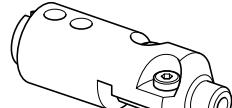


BHD-XB157T



BHD-BSB-13P

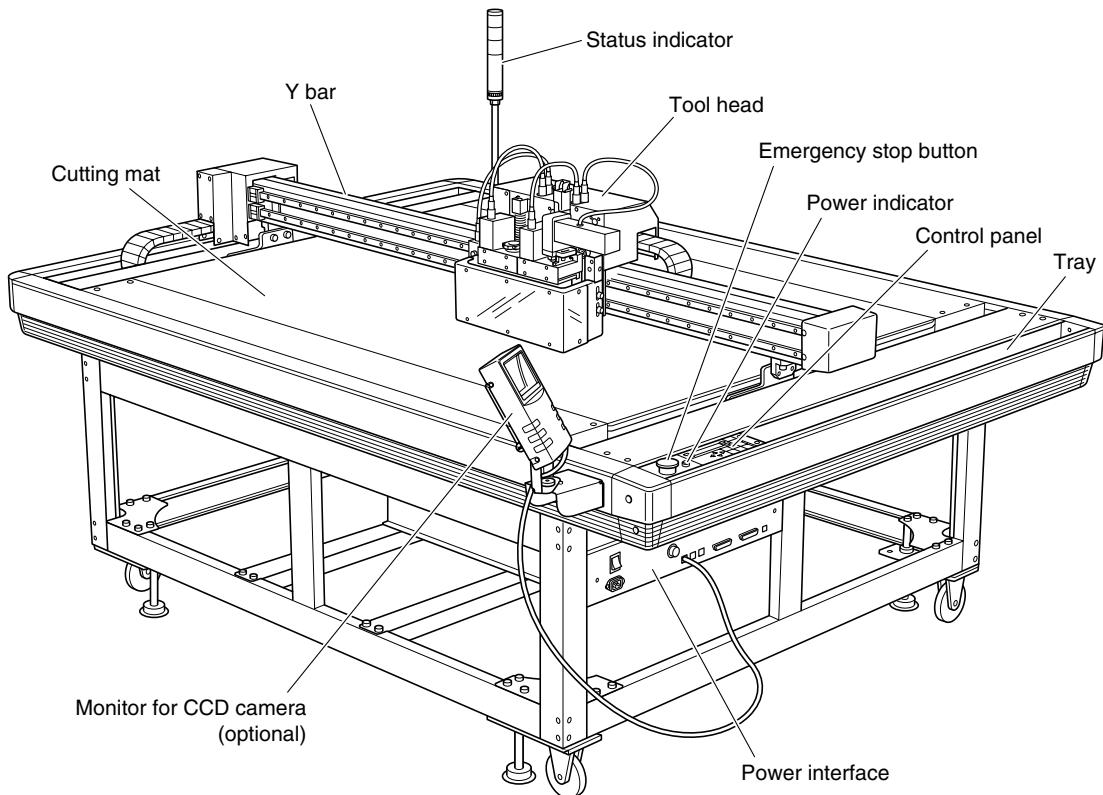
Blade holder (for use with the oscillation unit)



BHD-OS40

1.2 Part Identification and Functions

■ FC3600 part identification and functions



Tool head

: See page 1-5 for tool head part identification and functions.

Control panel

: Used to control the FC3600 and to specify various settings.

See page 1-7 for control panel part identification and functions.

Power interface

: See page 1-6 for power interface part identification and functions.

Status indicator

: Indicates the FC3600 status using lights and sounds.

Flashing red

Steady yellow

Flashing yellow

Steady green

: Error

Flashing red

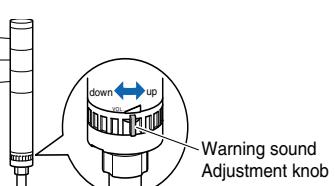
: Initialization when turned on

Steady or flashing yellow

: In use

Steady green

: Power on



Y bar

: Holds the tool head (with tangential head and pen block); moves left/right

Cutting mat

: The medium is loaded here for cutting (plotting).

Emergency stop button

: Press to stop the FC3600 in an emergency

Power indicator

: Remains lit to indicate that the FC3600 is on

Tray

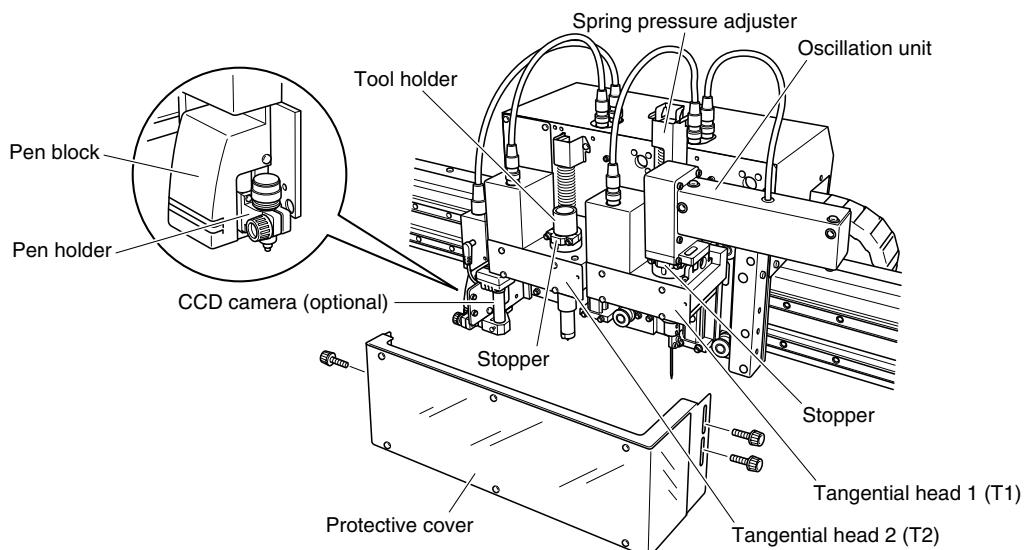
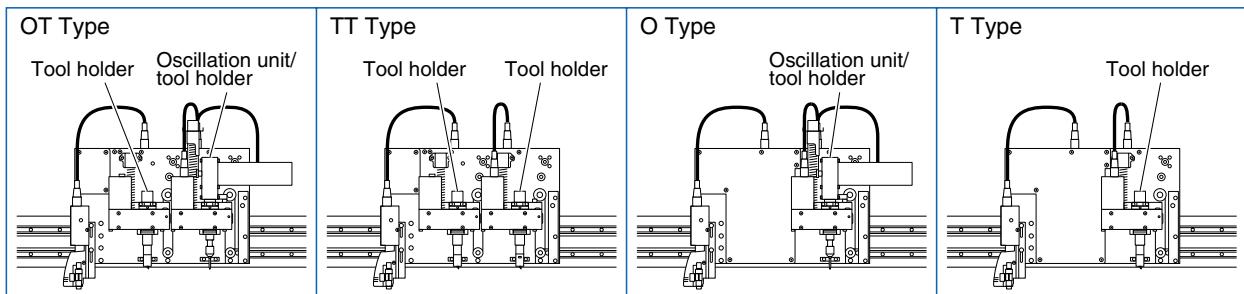
: Used to store tools and parts not in use

Monitor for the CCD camera (optional)

: Monitor equipped when an optional CCD camera is installed

■ Tool head part identification and functions

The four types of tool heads are specified below.



Pen block

: Drives the pen holder up and down

Pen holder

: Holds the cutter pen or plotter pen

Spring pressure adjuster

: Adjusts the load balance of the tangential head in accordance with the use of the tool holder or oscillation unit

Tangential heads (1 and 2)

: Drives the cutting tool (or creasing tool) up and down. In the figure above, tangential head 1 (T1) is shown at the right and tangential head 2 (T2) at the left.

Tool holder

: Holder used with the cutting tool (or creasing tool)

Oscillation unit (OT/O type only)

: Unit that vibrates the cutter blade vertically for cutting

Stopper

: Metal fixture that affixes the tool holder or oscillation unit to the tangential head

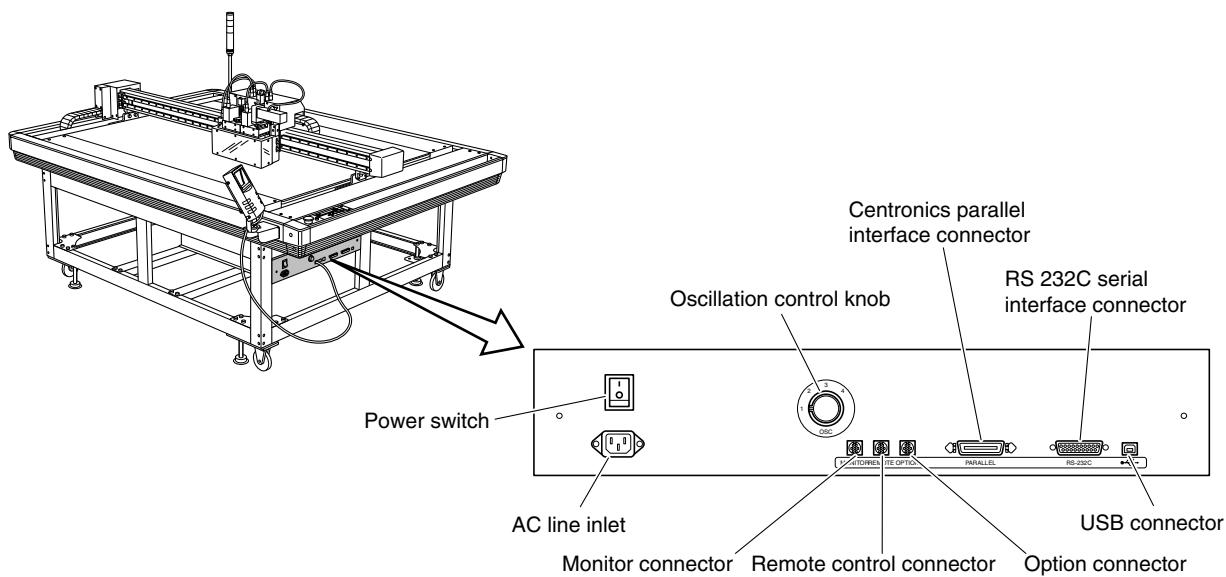
Protective cover

: Cover to prevent cutting injuries caused by the blade

CCD camera (optional)

: Digital loupe to ensure precise alignment

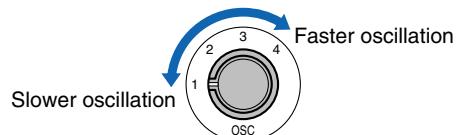
■ Power interface part identification and functions



AC line inlet

Power switch

Oscillation control knob (O or OT type only) : Adjusts the oscillation tool frequency. Turn the knob to a higher number setting for faster oscillation.



Centronics parallel interface connector

RS-232C serial interface connector

USB connector

Monitor connector

Remote control connector

Option connector

: Used to connect a Centronics cable

: Used to connect an RS-232C serial cable

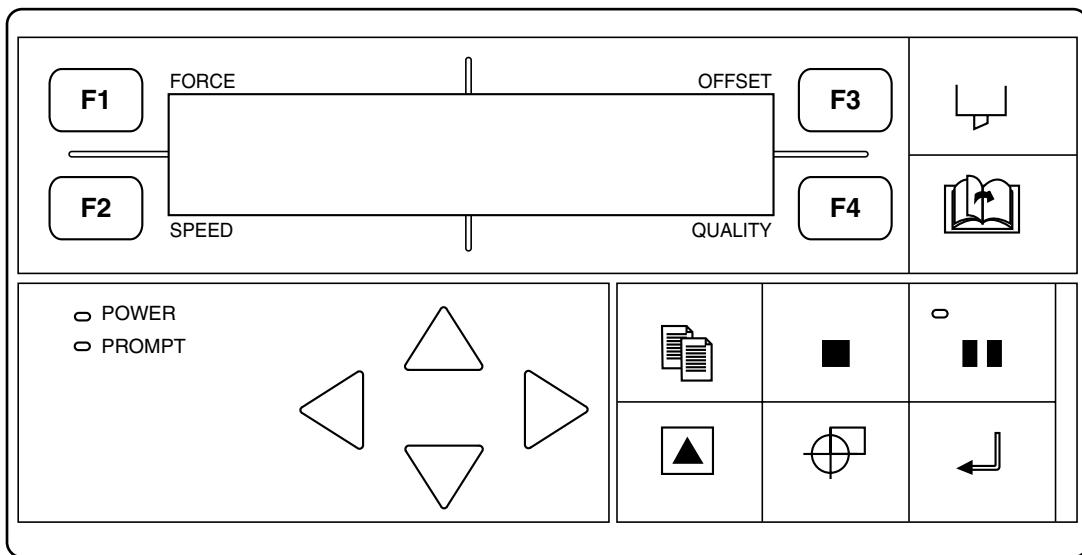
: Used to connect a USB cable

: Used to connect a monitor cable when an optional CCD camera is installed

: Used to connect to a remote controller

: An accessory connector used to connect optional devices

■ Control panel part identification and functions



Indicator Lamps

POWER

: The POWER lamp remains lit (green) while the FC3600 is on.

PROMPT

: The PROMPT lamp illuminates when the FC3600 receives data outside the effective operating area.

Function Keys



: When the FC3600 is paused, press the F1 key to select a function in MENU mode. When the FC3600 is online, press F1 to select Cutter Conditions number 1. After pressing the CONDITIONS key, use F1 to adjust the cutting FORCE.



: When the FC3600 is paused, press the F2 key to select a function in MENU mode. When the FC3600 is online, press F2 to select Cutter Conditions number 2. After pressing the CONDITIONS key, use F2 to adjust the cutting SPEED.

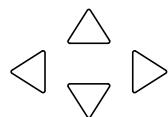


: When the FC3600 is paused, press the F3 key to select a function in MENU mode. When the FC3600 is online, press F3 to select Cutter Conditions number 3. After pressing the CONDITIONS key, use F3 to adjust the cutting OFFSET.



: When the FC3600 is paused, press the F4 key to select a function in MENU mode. When the FC3600 is online, press F4 to select Cutter Conditions number 4. After pressing the CONDITIONS key, use F4 to adjust the cutting QUALITY.

POSITION keys



Use the POSITION keys to change the setting values shown in various menu displays or to move the tool head. When a POSITION key is initially pressed, the tool head moves only the specified distance. If the key is held down, the tool head moves more quickly.

Menu Keys

-  **CONDITIONS key** : For changing the cutting conditions shown on the FC3600 display panel
-  **NEXT PAGE key** : For proceeding to the next menu page in MENU mode when the FC3600 is paused.
-  **PAUSE key** : For pausing and entering MENU mode to set functions in various menus. Pressing this key once pauses the display, as shown by a green indicator. Pressing it again cancels MENU mode and turns off the indicator. If the FC3600 receives data after this key is pressed, it will temporarily store the data in the data buffer.
-  **ENTER key** : Confirms and stores the selected settings. While the display is paused, the FC3600 can be reset by pressing the  **ENTER** and  **ORIGIN keys** simultaneously.
-  **STOP key** : Stops FC3600 operations
-  **ORIGIN key** : Changes the position of the coordinate system origin point
-  **COPY key** : Copies data stored in the data buffer for output
-  **TEST key** : For testing whether the cutting conditions are suitable for the medium. Also used for testing following adjustment of the creaser or cutter blades.

2

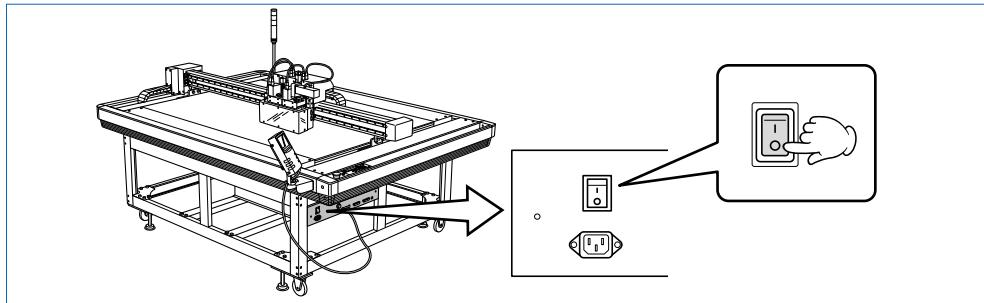
CONNECTING AND SETTING UP THE CUTTER PLOTTER

2.1	Connecting the FC3600 to a Computer	2-2
2.2	Plugging In and Turning On the FC3600.....	2-3
2.3	Types of Cutter Blades	2-5
2.4	Mounting Cutter Blades	2-7
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2.6	Mounting the Oscillation Unit (O and OT Types Only).....	2-12
2.7	Mounting the Plotter Pen/Cutter Pen (Option*).....	2-14
2.8	Adjusting the Pen Block Height for Medium Thickness	2-15
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2.11	Mounting the Cutting Mat.....	2-18
2.12	Loading the Medium.....	2-20
2.13	Vacuum Suction	2-22
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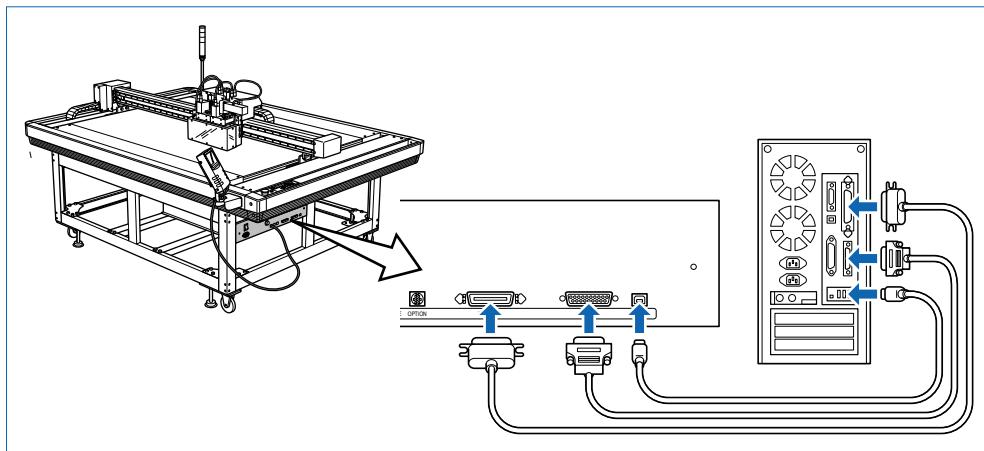
2.1 Connecting the FC3600 to a Computer

There are three ways to connect the FC3600 to a computer. Depending on software specifications and communication ports available on your computer, choose the Centronics parallel port, RS-232C serial port, or USB port. Connect the corresponding Graphtec cable (sold separately) for this port: a Centronics cable, RS-232C serial cable, or USB cable, respectively.

1. Make sure the power switch is turned off (the “O” side is pressed down).



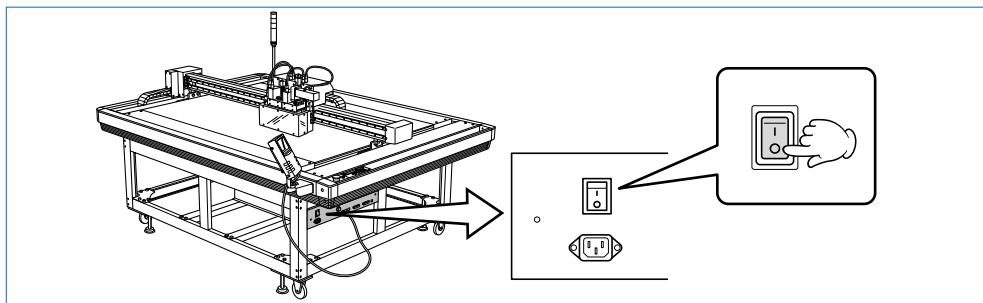
2. Connect one end of the cable to the FC3600 and the other end to the computer port. The cable connectors are designed to be connected in a specific orientation, so make sure each connector is correctly inserted into the corresponding connector on the FC3600 and computer.



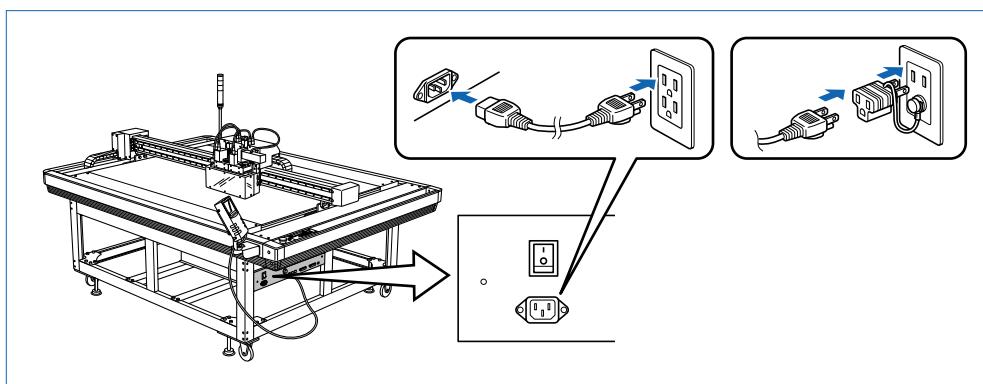
2.2 Plugging In and Turning On the FC3600

Use the power cable provided to connect the FC3600 to the AC power supply before turning it on.

1. Make sure the FC3600 Power switch is turned off (when the “O” side is pressed down).

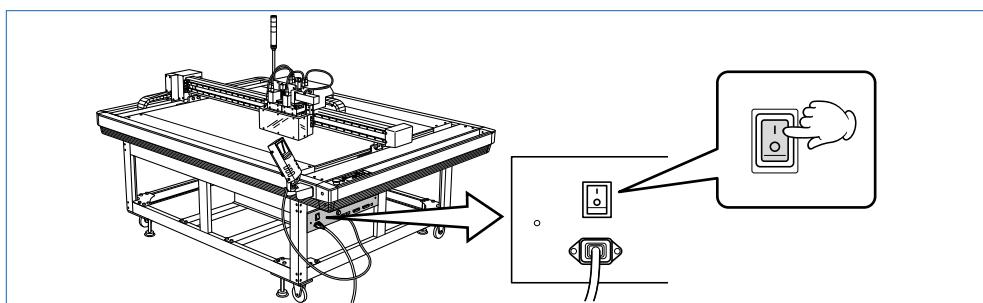


2. Connect one end of the provided power cable to the FC3600 AC line inlet and the other end to an electrical socket of the rated supply voltage.

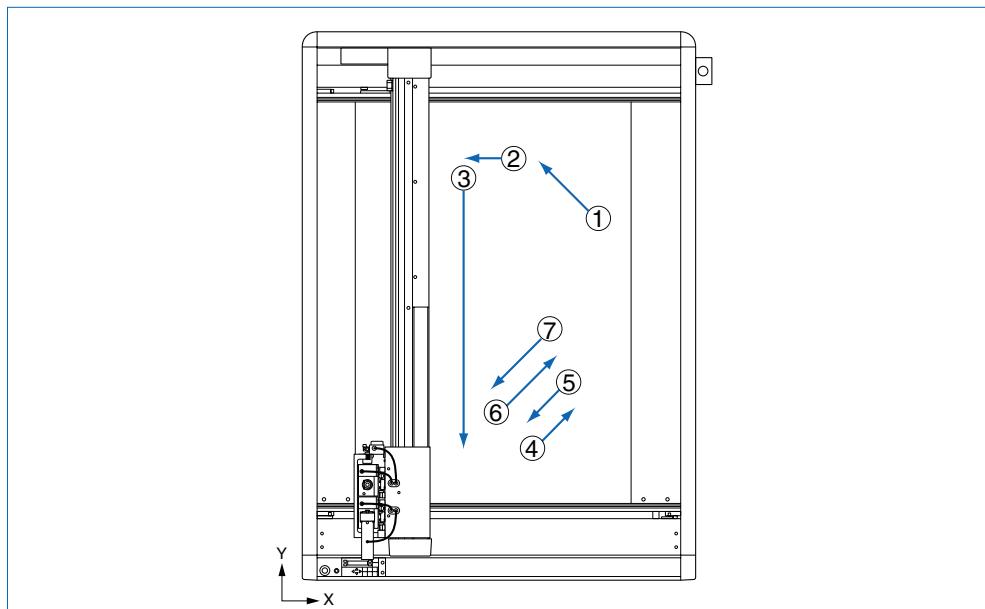


CAUTION The FC3600 must be grounded.

3. Turn on the FC3600 by pressing the “I” side of the switch. The control panel POWER lamp illuminates, and a memory check is performed.



4. Initialization is performed.



CHECKPOINT

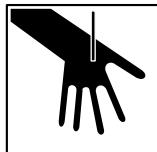
The FC3600 moves in the directions shown above after it is turned on. After the pen carriage returns to the origin point, it moves back and forth twice at a 45° angle to detect the friction coefficients of the FC3600 mechanisms. (The pen carriage moves in the order indicated by points ① to ⑦.)

5. Upon completion of initialization, the FC3600 is ready for use.

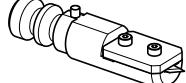
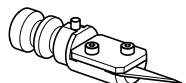
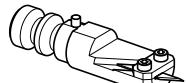
2.3 Types of Cutter Blades

Cutter blades have different characteristics. For optimal cutting results, select the cutter blade best suited to the cutting medium.

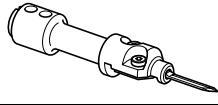
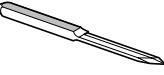
 **CAUTION** When handling cutter blades, be careful to avoid cutting yourself.



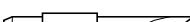
■ Types and Features of Cutter Blades for the Tool Holder

Shape of the blade holder	Shape of the cutter blade	Uses and features
BHD-XB57 	XB57 	Versatile, inexpensive blade for cutting many types of media. Ideal for cutting plastic film up to 1 mm in thickness.
BHD-XB157T 	XB157T 	Exclusively for cutting rubber up to 7 mm in thickness
BHD-BSB-13P 	BSB-13P 	Super-hard blade that can cut even thick media. Ideal for cutting paper board up to 1.5 mm in thickness, leather up to 2 mm in thickness, cardboard of E-flute thickness or thinner, or rubber up to 2.5 mm in thickness.
CHD-010 	—	Creasing tool for a creasing width of 1.0 mm
CHD-005 	—	Creasing tool for a creasing width of 0.5 mm

■ Types and Features of Cutter Blades for the Oscillation Unit

Shape of the blade holder	Shape of the cutter blade	Uses and features
BHD-OS20 	CB30U-OS20 	Super-hard blade exclusively for oscillation. Use this blade for media up to 12.5 mm in thickness.
BHD-OS40 	CB30U-OS40 	Super-hard blade exclusively for oscillation. Use this blade for media of a thickness of 12.5 mm or greater.

■ Types and Features of Cutter Blades for the Cutter Pen (Option)

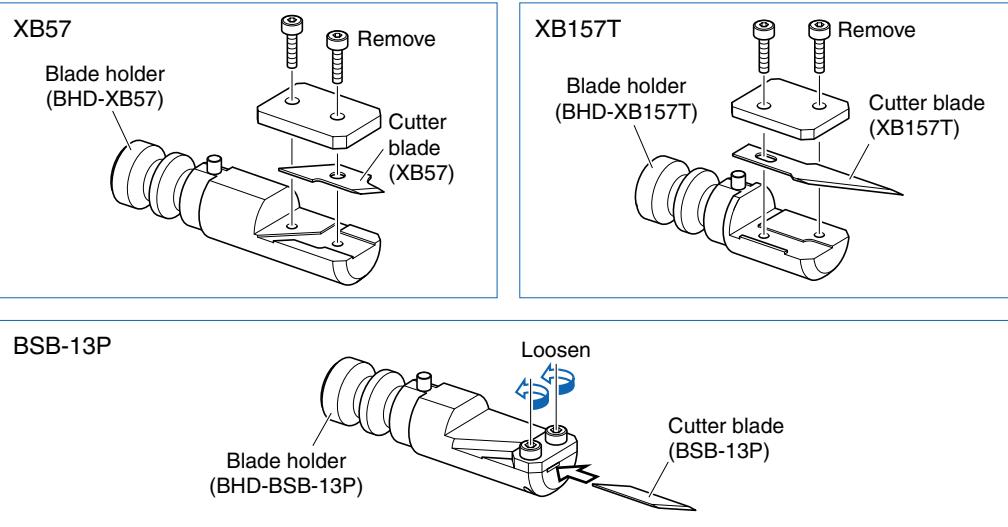
Blade's shape and part no.	Blade diameter and offset	Compatible plunger	Uses and features
CB09UA 	Ø0.9mm 0.45	PHP32-CB09N	The standard blade for cutting color adhesive-backed film. Suitable for cutting media up to 0.25 mm in thickness. Maximum blade service life: approx. 4000 m.
CB15U 	Ø1.5mm 0.75	PHP32-CB15N	Capable of cutting thicker film than the CB09UA blade. Suitable for cutting media 0.25 to 0.5 mm in thickness.

2.4 Mounting Cutter Blades

! CAUTION When handling cutter blades, be careful to avoid cutting yourself.

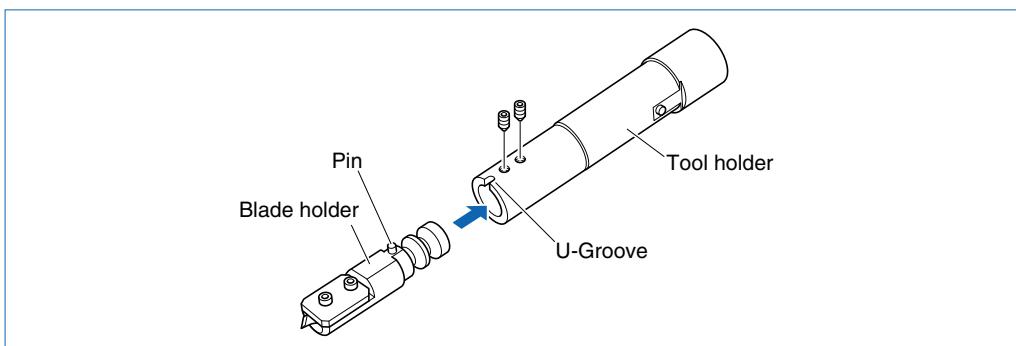
■ Loading Cutter Blades into the Tool Holder

Three types of blade holders are available for loading blades; choose the one that is compatible with the cutter blade to be used. Insert the blade between the blade holder and top plate and use the provided tool to tighten the affixing screws and secure the blade.



■ Mounting the Blade Holder on the Tool Holder

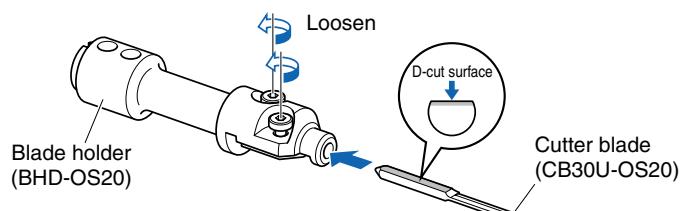
Align the blade holder pin with the U-groove of the tool holder, and insert as shown below. Use the tool provided to tighten the stopper screws and secure the blade holder. Follow the same procedure to mount the creasing tool.



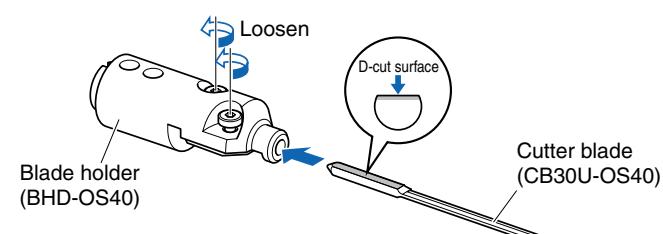
■ Mounting Cutter Blades into the Oscillation Unit

Two types of blade holders for cutting media of different thicknesses are available for loading blades into the oscillation unit; choose the one that is compatible with the cutter blade for the medium to be cut. Insert the cutter blade with the flat D-cut surface aligned with the surface having screws, and use the provided tool to tighten the affixing screws and secure the cutter blade.

CB30U-OS20

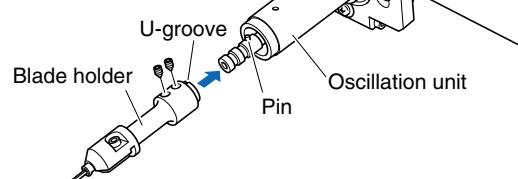


CB30U-OS40



■ Mounting the Blade Holder on the Oscillation Unit

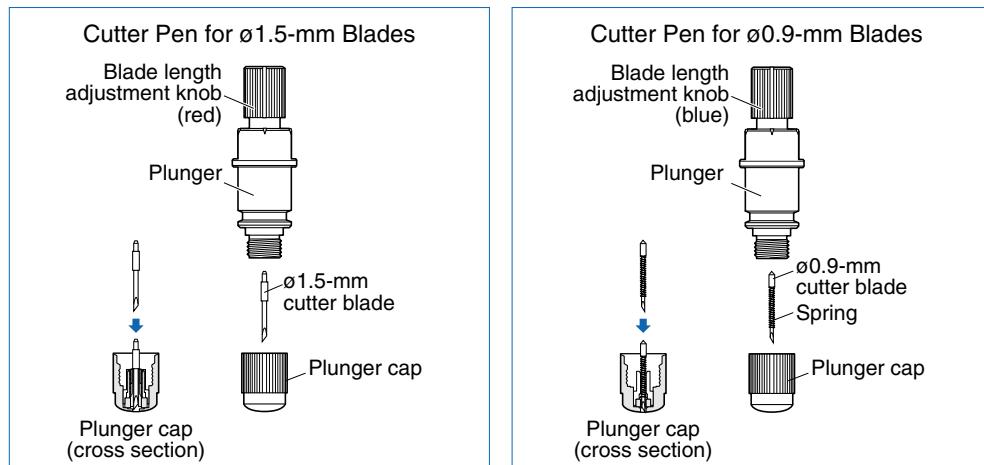
Align the U-groove of the blade holder with the oscillation unit pin and insert as shown below. Use the provided tool to tighten the affixing screws and secure the blade holder.



■ Mounting the Cutter Blade for the Optional Cutter Pen

Cutter blades are mounted in the cutter pen plunger. Two cutter pen plungers of different diameters are available. Be sure to mount a cutter blade compatible with the cutter pen plunger.

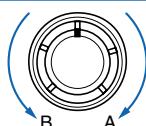
1. Turn the blade length adjustment knob counterclockwise to retract the blade into the plunger.
2. Turn the plunger cap counterclockwise and remove from the plunger.
3. Insert the replacement blade into the opening in the plunger cap.
4. With the blade inserted into the plunger cap, attach the plunger from above.



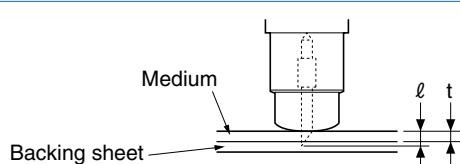
■ Adjusting the Blade Length

If the blade extends too far for the thickness of the medium being cut, it may damage the cutting mat. Adjust the blade length carefully.

1. Adjust the blade length by turning the blade length adjustment knob. Turn the knob in the "A" direction to extend the blade, or in the "B" direction to retract the blade. When the knob is turned one scale unit, the blade moves approximately 0.1 mm. A full turn of the knob moves the blade approximately 0.5 mm.



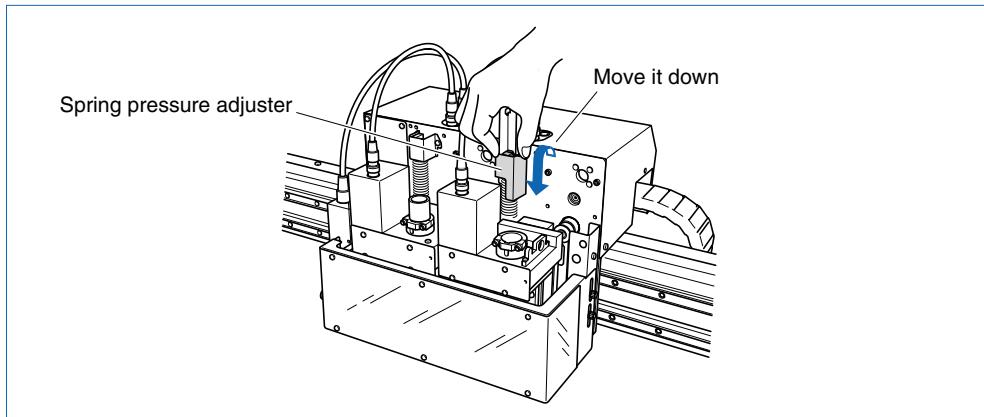
2. Align the blade tip with the tip of the cutter pen, then extend the blade tip to a length suitable for the medium.
3. As a guideline for blade length, assuming that the medium thickness is "t" in the figure below, the blade length "l" should be equal to or slightly greater than "t." Make sure the blade length is never greater than the combined thickness of the medium and the backing sheet. If the medium thickness cannot be determined accurately, adjust the blade length by gradually increasing it until only traces of the blade remain on the backing sheet following a cutting test.



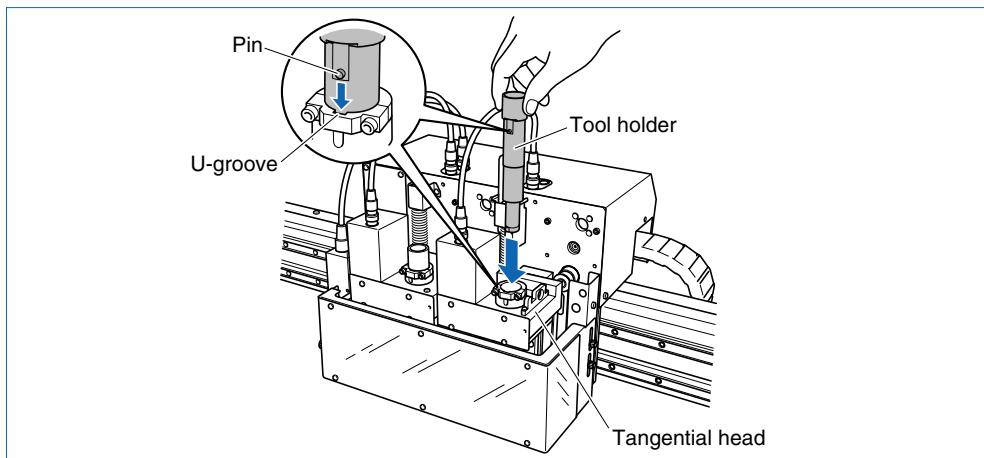
2.5 Mounting the Tool Holder

Follow the same procedure to mount the tool holder in both tangential heads (T1 and T2).

1. Make sure the power switch is turned off (the “O” side is pressed down).
2. Lower the spring pressure adjuster on the tangential head. (Note that the T and TT types do not include a spring pressure adjuster.)

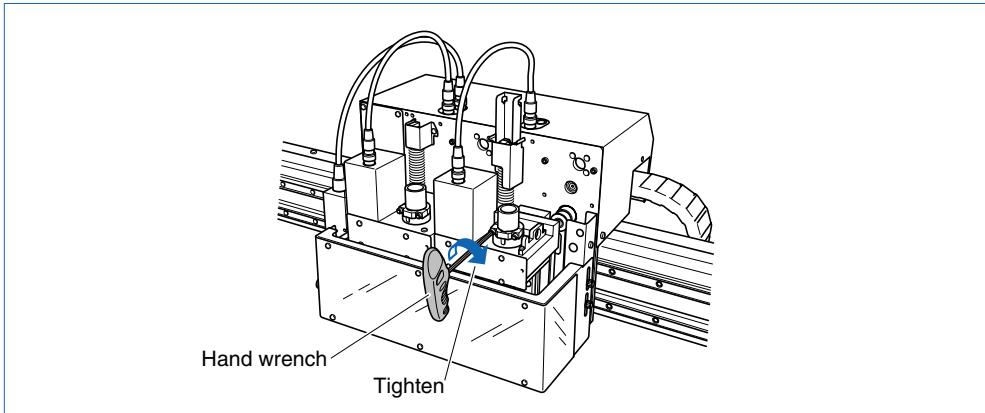


3. Align the tool holder pin with the U-groove of the tangential head and insert the tool holder fully into the tangential head.



CAUTION After pushing the tool holder fully into the tangential head, tighten the stopper screws. If the screws are too loose, accidents may result.

4. Use the provided hand wrench to tighten the stopper screws.

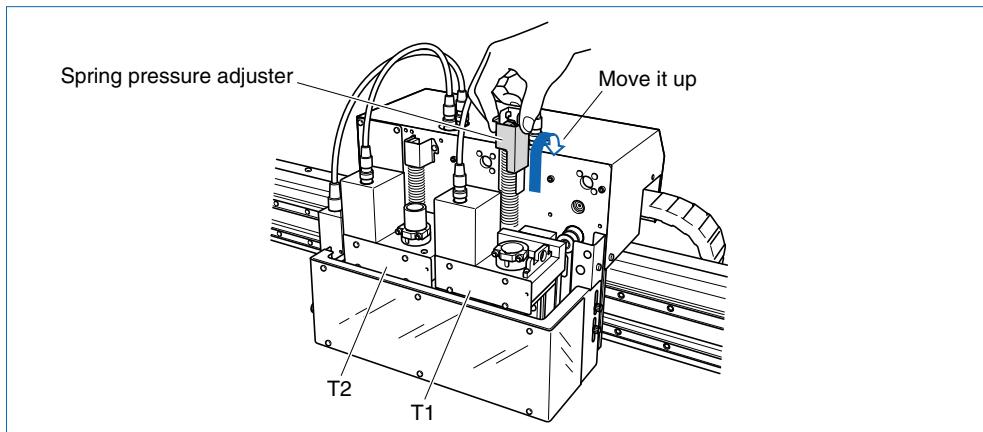


⚠ CAUTION Tighten the stopper screws on the tangential heads even if nothing is mounted. If the screws come loose during operations, accidents may result.

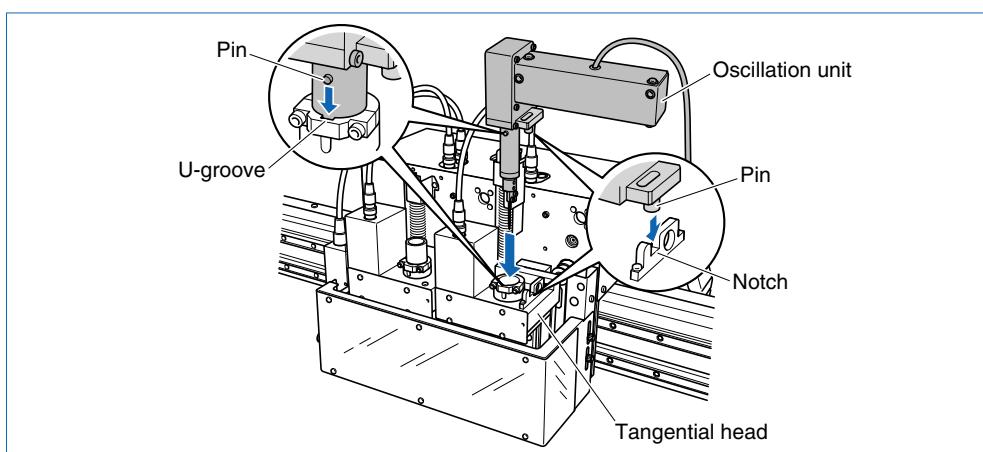
2.6 Mounting the Oscillation Unit (O and OT Types Only)

The oscillation unit can be mounted on the T1 tangential head only.

1. Make sure the power switch is turned off (the “O” side is pressed down).
2. Raise the spring pressure adjuster on the tangential head.

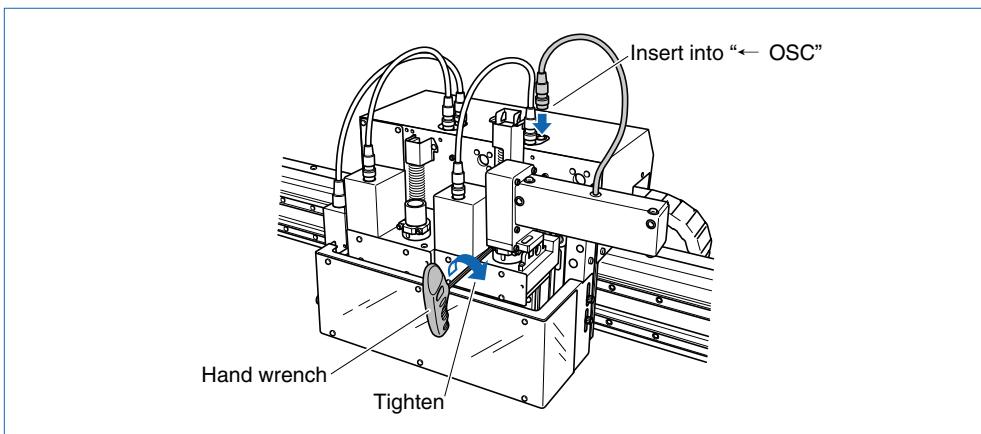


3. Align the oscillation unit pin and the U-groove of the tangential head with the notch rotation stopper and insert the oscillation unit fully into the tangential head, as shown below.



CAUTION After pushing the oscillation unit fully into the tangential head, tighten the stopper screws. If the screws are too loose, accidents may result.

4. Use the provided hand wrench to tighten the stopper screws. Insert the oscillation unit connector into the connector labeled “OSC” on the top of the Y slider.



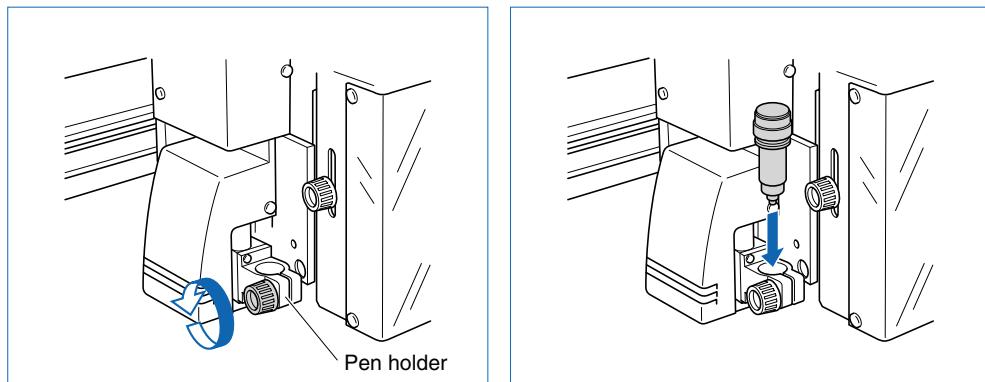
CAUTION Tighten the stopper screws on the tangential heads even if nothing is mounted. If the screws come loose during operations, accidents may result.

2.7 Mounting the Plotter Pen/Cutter Pen (Option*)

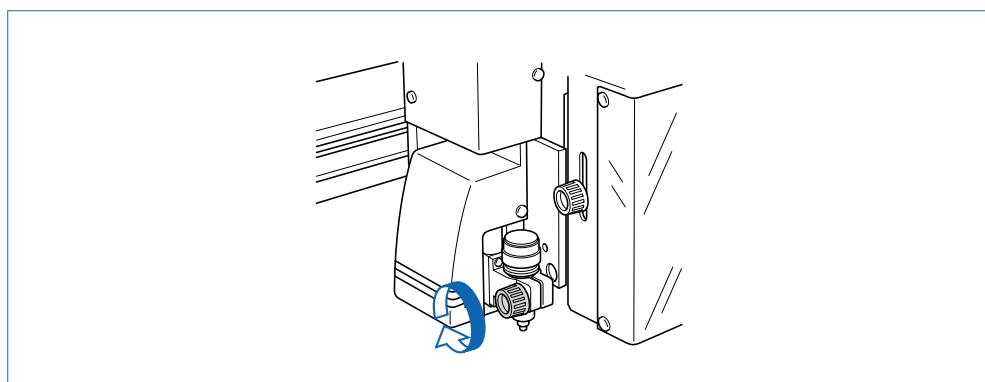
* See the Supplies table in Appendix B for the selection of cutter pens and blades.

Follow the procedure described below to mount a plotter pen or a cutter pen for which the blade length has been adjusted.

1. Make sure the power switch is turned off (the "O" side is pressed down).
2. Loosen the pen holder screw, then mount the pen.



3. After mounting the pen, tighten the pen holder screw.

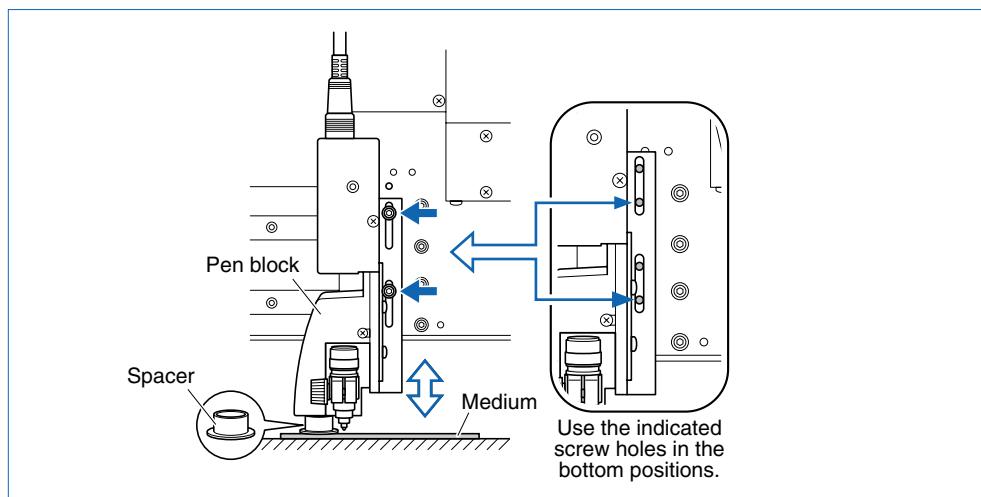


2.8 Adjusting the Pen Block Height for Medium Thickness

! CAUTION Be sure to adjust the pen block height to suit the medium thickness. Setting the pen block too low may result in damage if the unit catches on thick material.

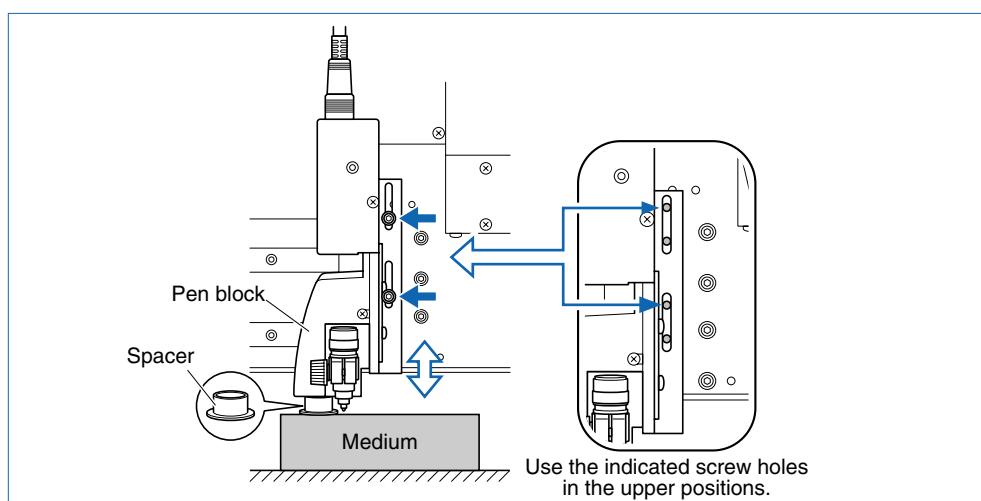
■ For Media Less than 23 mm in Thickness

1. Make sure the power switch is turned off (the “O” side is pressed down).
2. Remove the protective cover.
3. In the two lower screw holes, temporarily tighten the screws partially and lift the pen block. After using the provided spacer to adjust the height, use the provided tool to tighten the screws and secure the pen.



■ For Media 23 mm or More in Thickness

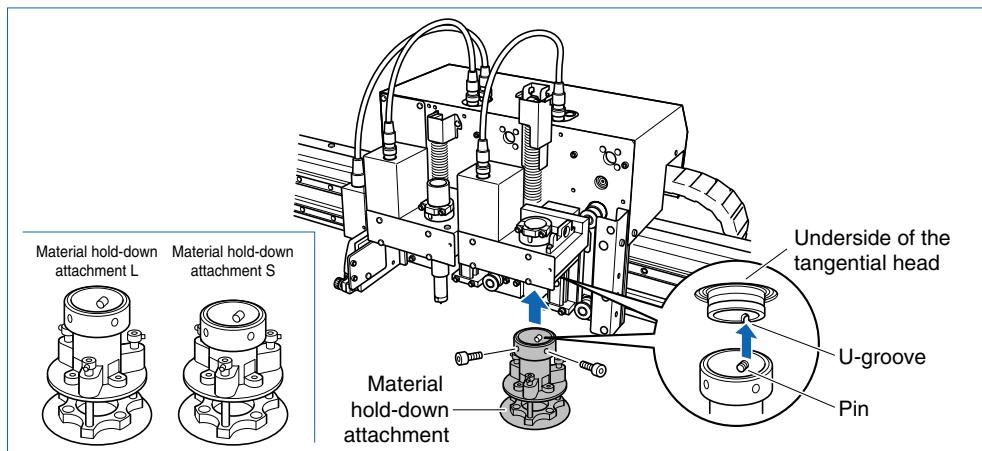
1. Make sure the power switch is turned off (the “O” side is pressed down).
2. Remove the protective cover.
3. In the two upper screw holes, temporarily tighten the screws partially and lift the pen block. After using the provided spacer to adjust the height, use the provided tool to tighten the screws and secure the pen block.



2.9 Mounting the Optional Material Hold-Down Attachment

An optional material hold-down attachment can be mounted to hold down media.

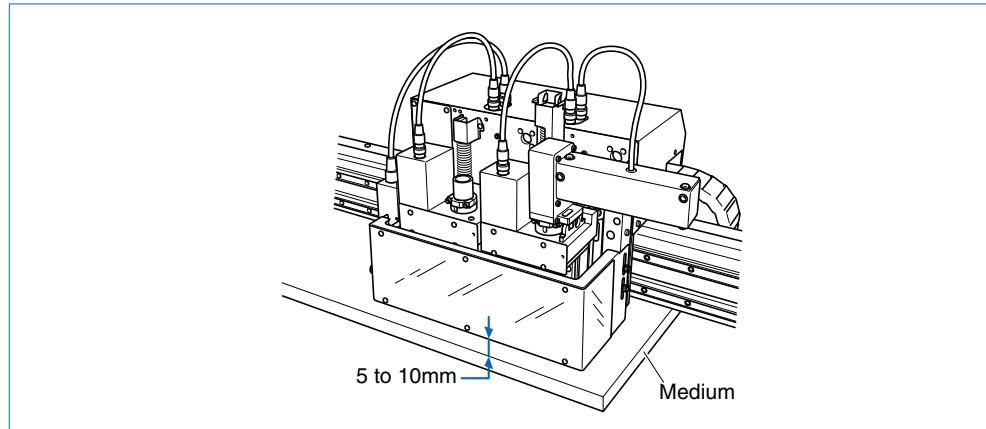
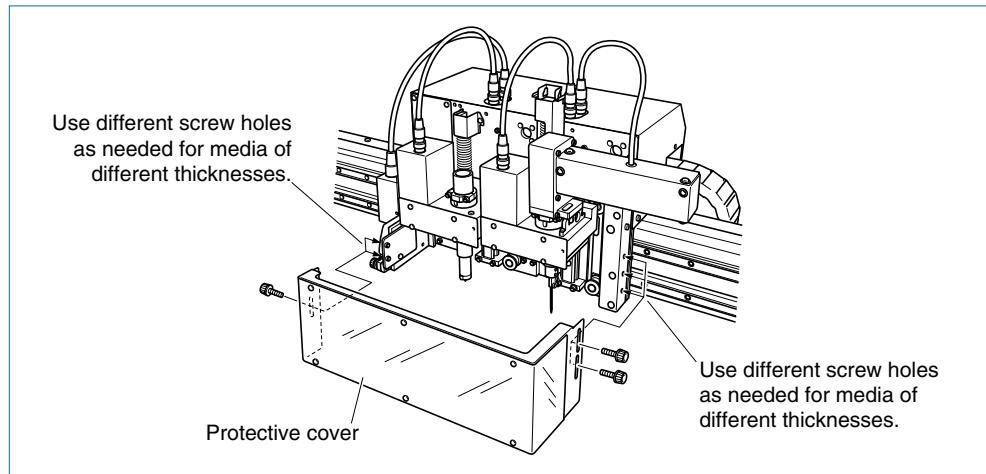
1. Make sure the power switch is turned off (the “O” side is pressed down).
2. Remove the protective cover.
3. Hold the material hold-down attachment so that the screws to secure the oscillation unit are facing you, then attach it to the bottom of the tangential head. Firmly push it fully into the tangential head, then use the provided tool to tighten the screws and secure it.



2.10 Mounting the Protective Cover

! CAUTION The tool holder and oscillation unit of the FC3600 have sharp blades. To avoid injury and accidents, always attach the protective cover.

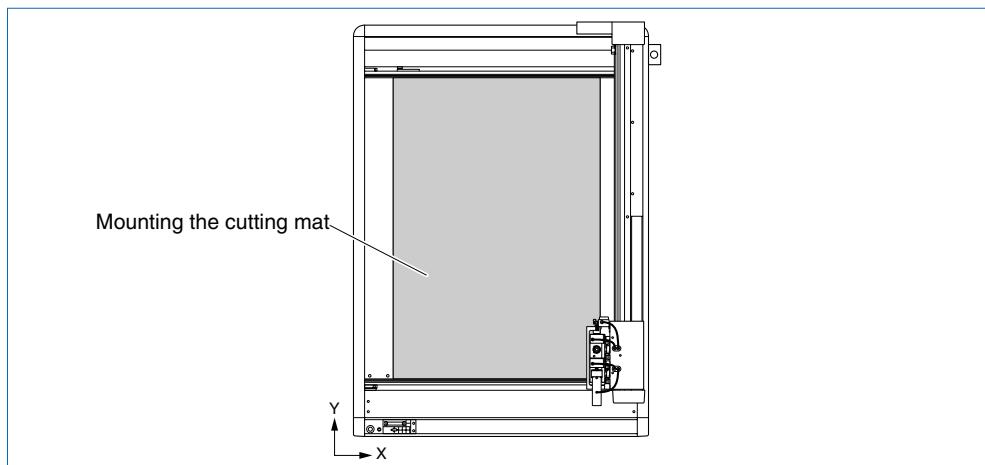
1. Make sure the power switch is turned off (the “O” side is pressed down).
2. Attach the protective cover and adjust it so there is a space of 5 to 10 mm between the cover and the medium. Tighten the three screws to firmly secure it.



2.11 Mounting the Cutting Mat

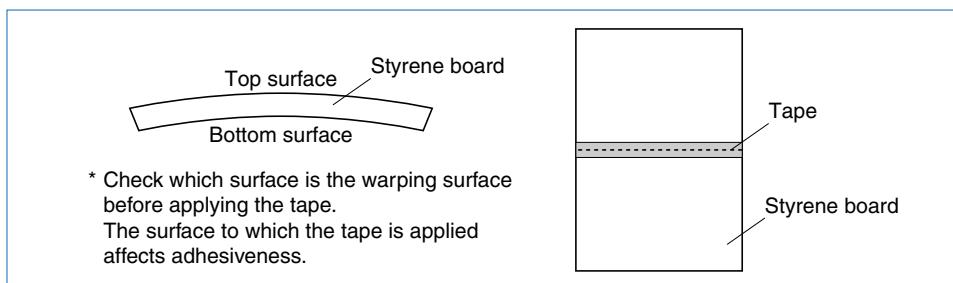
! CAUTION Failure to mount the cutting mat before using the FC3600 may damage the cutter blade and the FC3600 itself. Make sure the cutting mat is in place before starting work.

1. Use the **◀▶△▽ POSITION keys** to move the tool head out of the way for mounting of the cutting mat.
2. Turn off the power switch (press the “O” side down).
3. Mount the cutting mat.

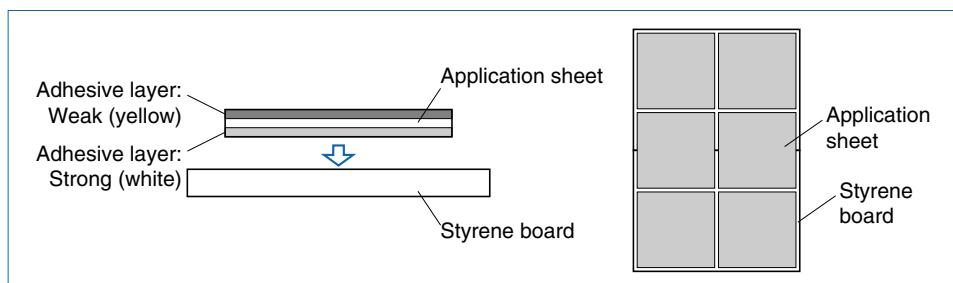


Cutting Mat for the Tool Holder: Styrene Board and Application Sheet

- Use the provided packaging tape to join two sheets of styrene board. Apply the tape to the convex, warping surface, then mount the mat onto the FC3600 so that the tape surface is underneath.



- Position the application sheets with the strong adhesive layer (white surface) underneath, and mount these application sheets on the styrene board as shown below.



Cutting Mat for the Oscillation Unit: Felt

- Mount the felt mat onto the FC3600.

Cutting Mat for the Plotter Pen or Cutter Pen: Felt and PP Board (Plastic)

- Mount the felt mat onto the FC3600.
- Mount the PP board over the felt.

 **CAUTION** Setting up the cutting mat with the power on may lead to accidents. Make sure power is off before performing setup work.

2.12 Loading the Medium

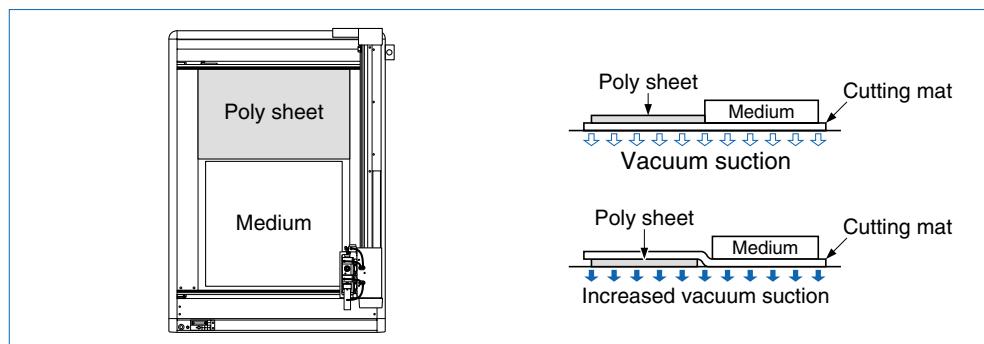
! CAUTION Be sure to adjust the pen block height to suit the medium thickness before loading the medium. Setting the pen block too low may result in damage if the unit becomes caught on thick material.

1. Use the  **POSITION keys** to move the tool head out of the way for loading the medium.

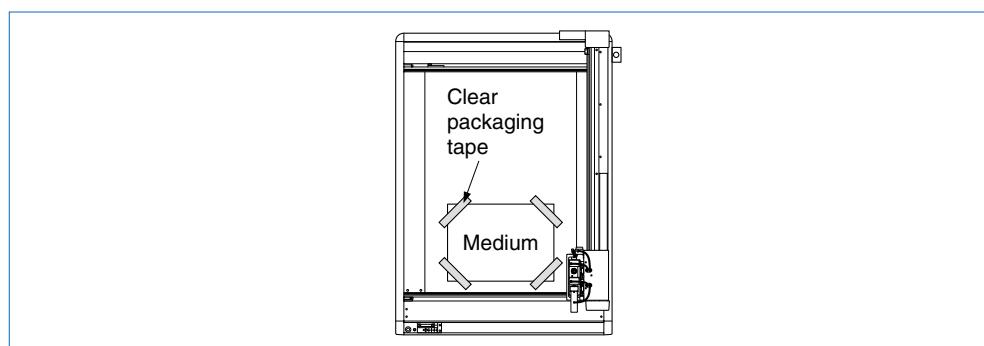
2. Turn off the power switch (press the “O” side down).

3. Flatten media that tend to curl before loading them on the cutting mat.

To enhance the vacuum suction, cover the bare areas outside the media area using a commercially available poly sheet. The vacuum suction can be further enhanced by laying the poly sheet under the cutting mat. If the medium is too small to be held by the vacuum suction and cannot be affixed, cover the medium and the entire cutting mat with a poly sheet.



If the medium cannot be affixed by vacuum suction, secure the corners with packaging tape.



CHECKPOINT

When affixing the medium, check which surface is the warping surface and load it as shown below. The suction power varies depending on the direction of the warping.



4. Confirm that the medium is firmly secured and will resist moving when subjected to the cutting force.



CAUTION

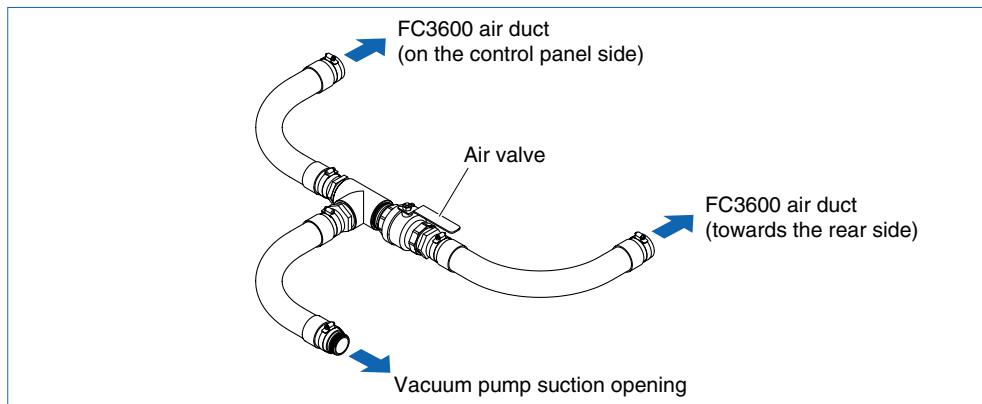
- Media that is not firmly secured may lead to damage such as broken blades.
- Loading material with the power on may lead to accidents. Make sure the power is off before performing setup work.

2.13 Vacuum Suction

The vacuum suction area is selectable: the full writing panel area or half the writing panel area (control panel side). The vacuum suction force is stronger when only half the panel is used. Please select the appropriate suction area according to the size of your material.

■ Vacuum Pump Hose Connection Kit for the Vacuum Suction Unit

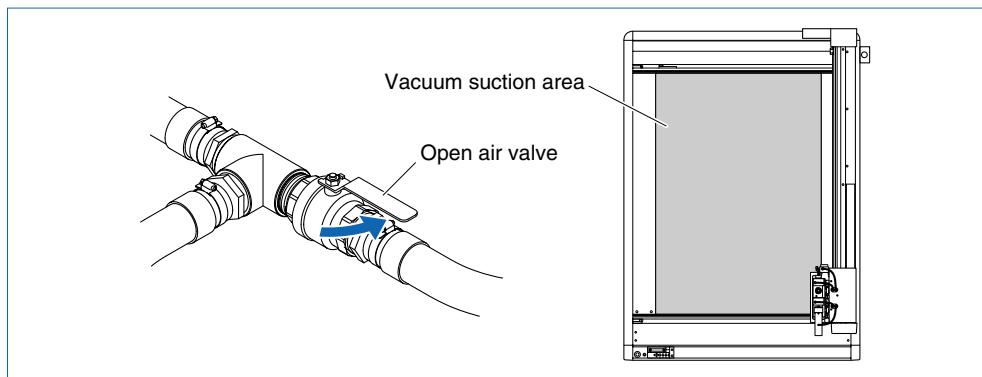
The vacuum pump hose connection kit is used to connect the vacuum pump to the FC3600's vacuum suction unit.



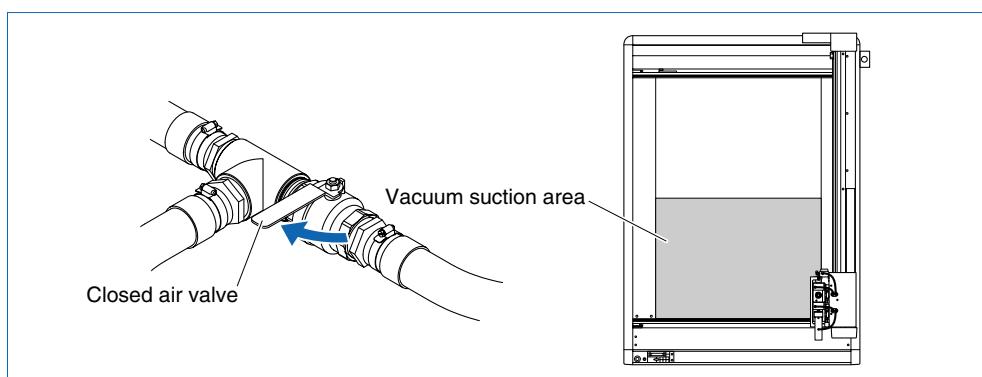
■ Switching Between the Vacuum Suction Areas

The open/closed status of the air valve determines whether the vacuum suction area covers the full writing panel or only half the panel.

- Full writing panel area



- Half the writing panel area



2.14 Daily Servicing and Maintenance

■ Prior to Extended Disuse

- To keep the rail lubricated, fully slide the Y bar back and forth two or three times approximately every two weeks.
- Additionally, slide the tangential heads up and down through all positions every two or three weeks.

3

BASIC SETTINGS AND OPERATIONS

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3.1 Reference Values for Cutting Conditions

Before cutting, specify the tangential head or pen block, pen (blade) type as well as the blade length, cutter offset, cutting or pen force, and cutting speed and quality. For best cutting results, specify all of these criteria.

- (1) Selection of tangential head or pen block
: Choose the tangential head or pen block to be used.
- (2) Selection of cutter blade: Specify a suitable blade for the medium to be cut.
- (3) Extended length of the cutter blade (when using a cutter pen)
: See the table of medium thicknesses below for adjustment of the extended length of the cutter blade. For instructions, see the section "Adjusting the Blade Length" on page 2-9.
- (4) Down height (when using a tangential head)
: In accordance with medium thickness
- (5) Cutting force (when using a cutter pen)
: In accordance with the reference values listed below
- (6) Cutter offset (when using a cutter pen)
: In accordance with the blade
- (7) Cutting speed
: In accordance with the reference values listed below
- (8) Cutting quality
: In accordance with the reference values listed below

Tangential Cutter Reference Values for Various Media

Medium	Thickness (mm)	Blade	Cutting force	Speed	Quality
Cardboard	1.5 mm or less	XB57	100	10	4
	1.5 mm or less	BSB-13P	100	10	4
Plastic sheets	1 mm or less	XB57	100	10	4
Corrugated cardboard	E-flute or thinner	XB57	100	10	4
	E-flute or thinner	BSB-13P	100	10	4
Leather	2 mm or less	BSB-13P	100	10	4
Rubber	1.5 mm or less	BSB-13P	100	10	4
	7 mm or less	XB57T	100	10	4

Oscillation Cutter Reference Values for Various Media

Medium	Thickness (mm)	Blade	Cutting force	Speed	Quality
Styrene board	12.5 mm or less	CB30U-OS20	100	5	4
	25 mm or less	CB30U-OS40	100	1	4
Styrofoam	12.5 mm or less	CB30U-OS20	100	5	4
	12.5 mm to 30 mm	CB30U-OS40	100	1	4
Urethane foam	12.5 mm or less	CB30U-OS20	100	1	4
	12.5 mm to 30 mm	CB30U-OS40	100	1	4

Cutter Pen Reference Values for Various Media

Medium	Thickness (mm)	Blade	Cutting force	Speed	Quality
Film for outdoor signs	0.05 to 0.08	CB09UA	10 to 14	30 or less	2
Decorative film	0.08 to 0.1	CB09UA	14 to 17	30 or less	2
Transparent or semi-transparent film	0.08 to 0.1	CB09UA	14 to 20	30 or less	2
Reflective film	0.08 to 0.1	CB09UA	14 to 20	30 or less	2
Fluorescent film	0.20 to 0.25	CB09UA, CB15U	20 to 21	10 to 20	1

Cutter and Plotter Pen Offset Values

Blade or pen type	Blade part no.	Displayed offset		Setting range	Default offset
		Blade type	Default display		
Supersteel blade	CB09UA	09U	0	±5	18
	CB15U	15U	0	±5	28
Pen		Pen	—	—	0

When a **09U** or **15U** blade has been selected, the default offset value is adjustable within a ± 5 range. When a plotter **pen** is mounted, select “**PEN**” on the display. There is no offset setting value for pens.

Plotter Pen Reference Values

Pen type	Pen force	Speed	Quality
Water-based fiber-tip pen	10 to 12	30	2

To avoid unnecessary wear on the pen tip, specify a minimal pen force setting. When specifying the speed value, confirm that the plotted results are not too faint or otherwise unsatisfactory.

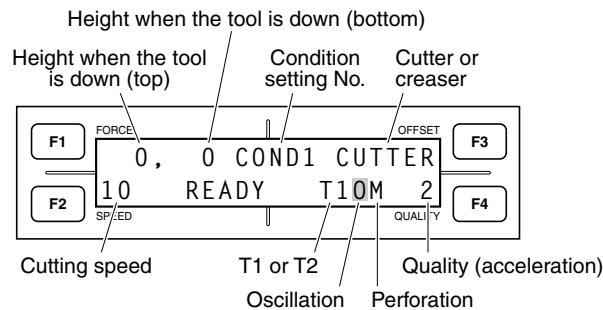
CHECKPOINT

- Larger number for speed and quality settings results in a coarser finish but shortens the overall cutting or plotting time.
- Smaller numbers for speed and quality settings results in a finer finish but lengthens the overall cutting or plotting time.

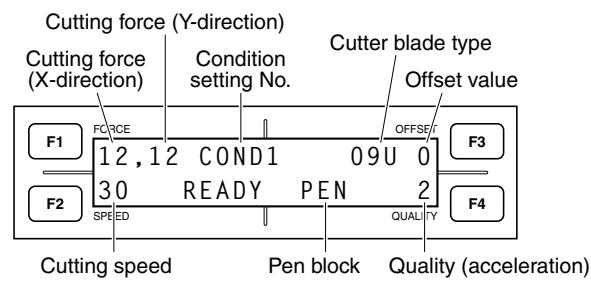
3.2 Current Setting Display

When the FC3600 is in READY status, the current setting details (cutting conditions) are shown on the control panel display.

When the Tangential Head (T1 or T2) is Selected



When the Pen Block is Selected



3.3 Selecting and Registering Sets of Cutting Conditions

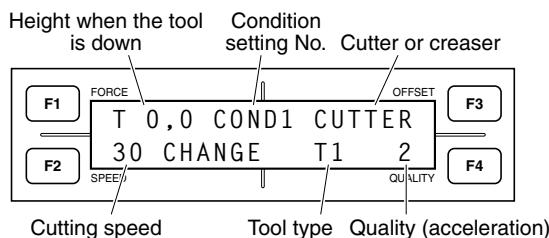
Four different sets of user-defined cutting conditions can be registered in the FC3600 memory as COND Nos. 1 through 4. You can easily switch between predefined cutting conditions by selecting a different COND No. These conditions correspond to keys **F1** to **F4**.

- **F1** key: COND 1 - **F2** key: COND 2 - **F3** key: COND 3 - **F4** key: COND 4

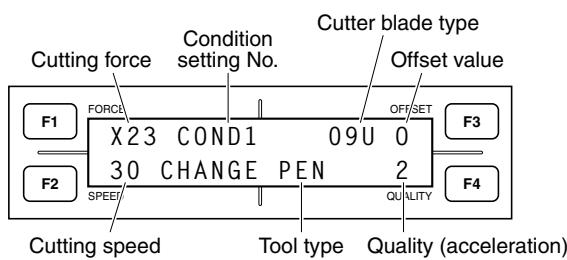
Registering Conditions

When the FC3600 is in READY status, press a **function key** from **F1** to **F4** corresponding to the desired condition number. Next, press the **CONDITIONS** key. Register each condition value in the settings by pressing the **ENTER** key. The details during setup are displayed as described below.

When the Tangential Head (T1 or T2) is Selected



When the Pen Block is Selected



The default values are as shown below for all condition numbers when the FC3600 is in READY status.



Condition Selection

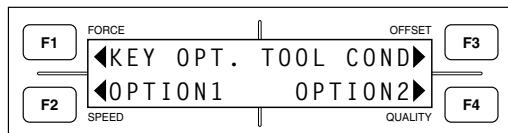
Press a **function key** (**F1** to **F4**) to select the corresponding set of predefined cutting conditions and press the **ENTER** key to confirm your choice.

3.4 Selecting the Tangential Head or Pen Block

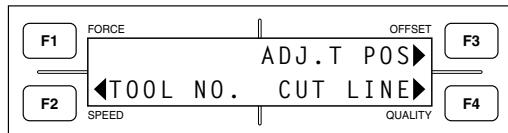
This setting determines the selection of the tangential head or pen block to be used in conditions 1 to 4. Different setting items apply when the tangential head and pen block are used, so complete these settings before specifying conditions.

(All default values: 1)

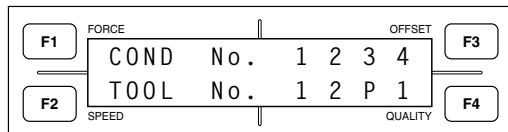
1. Press the  **PAUSE key** to put the FC3600 offline.
2. Press the  **NEXT PAGE key** repeatedly until the following menu is displayed.



3. Press the  **key (TOOL COND)** to display the menu shown below.



4. Press the  **key (TOOL NO.)** to display the tool selection menu.



5. The COND No. options (1 to 4) represent the condition numbers. Use the  or  **POSITION key** to move the cursor and select the condition number. Then select the desired tool, using the  or  **POSITION key** to display tool numbers (see below) in sequence.

P : Pen block

1 : Tangential head 1 (T1)

2 : Tangential head 2 (T2) (TT or OT type only)

After selecting the desired tool, press the  **ENTER key** to confirm your choice. To cancel setup, press the  **NEXT PAGE key**.

6. Press the  **PAUSE key** to put the FC3600 online again.

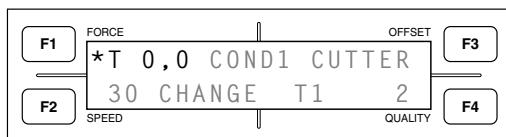
3.5 Specifying Conditions When the Tangential Head is Selected

This setting determines the cutting conditions when using the tangential head. Specify the conditions after selecting 1 (for T1) or 2 (for T2) in the condition number to be used. (See section 3-4 "Selecting the Tangential Head or Pen Block".)

■ Specifying the Height When the Tool is Down

The cutting force when using the tangential head is determined by the height when the tool is down. Choose settings suitable for the thickness of the medium to be cut.
(Default values: T: 0; B: 0; and P: 100)

1. Load the medium to be cut and secure with the vacuum pump.
2. Press a **function key from F_1 to F_4** to select the COND No. Press the \square **CONDITIONS key** to display the conditions.
3. Press the F_1 **key** to move the cursor to the FORCE area.



4. Use the F_1 **key** to toggle between applying and removing the **asterisk**. When the **asterisk** is displayed, the cutter moves to the specified height along the Z-axis (up and down). Use the \triangle or \square **POSITION key** to cycle through **T**, **B**, and **P**. Use the \triangle or \square **POSITION key** to increase or decrease the numerical value for **T** and **B** between **0** and **62** mm until the desired value is reached. Although the numerical value for **P** switches between **80**, **90**, and **100**, this value should be left at the default value of **100**.

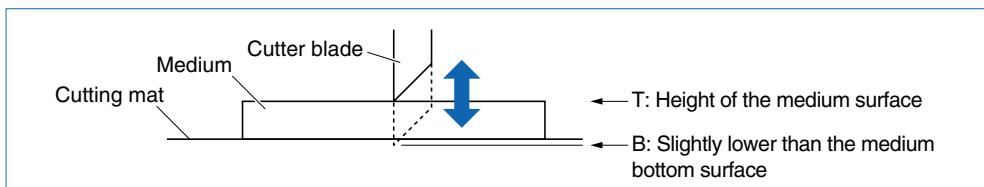
T : Height of the medium top surface

B : Height of the medium bottom surface

When the tool holder is used: Set it 0.5 to 1.0 mm lower than the bottom surface of the medium.

When using the oscillation unit: Set it 1.5 to 2.0 mm lower than the bottom surface of the medium.

P : Maximum cutting force (maximum cutting force produced if the cutter cannot move to the specified height)



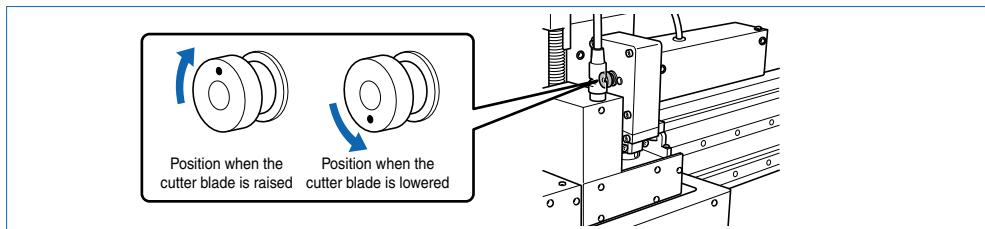
CHECKPOINT

- Set T and B while the vacuum pump is applied to the cutting mat.
- B should never be greater than T.

Press the \square **ENTER key** upon completing the settings. To continue specifying conditions, press a **function key from F_1 to F_4** to move the cursor to the setting item to be updated.

Oscillation Unit Settings

To use the oscillation unit, specify T (the height of the medium top surface) when the cutter blade is lowered. Specify B (the height of the medium bottom surface) when the cutter blade is raised.

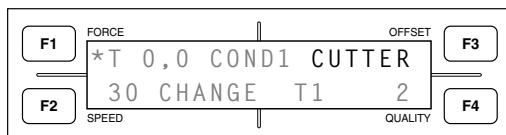


■ Selecting the Cutter or Creasing Tool

This setting determines the selection of the cutter or creasing tool.

(Default: Cutter)

1. Press a **function key from F_1 to F_4** to select the COND No. and press the \square **CONDITIONS key** to display the conditions.
2. Press the F_3 **key** to move the cursor to the OFFSET area.



3. Use the \triangle or \square **POSITION key** to toggle between the **Cutter** and **Creaser** settings and select the desired mode. Press the \square **ENTER key** upon completing the settings. To continue specifying conditions, press a **function key from F_1 to F_4** to move the cursor to the setting item to be updated.

CHECKPOINT

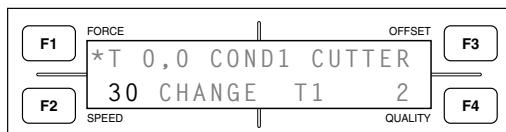
If the creasing tool is selected, pressing the \square **ENTER key** displays the creasing settings; continue to specify the creasing settings. (See section 3-7 for "Specifying Creasing (Scoring) Conditions".)

■ Setting the Speed

This setting determines the speed at which work is performed. For settings details, see section 3.1 "Reference Values for Cutting Conditions".

(Default value: 10)

1. Press a **function key from F_1 to F_4** to select the COND No. Press the \square **CONDITIONS key** to display the conditions.
2. Press the F_2 **key** to move the cursor to the SPEED area.



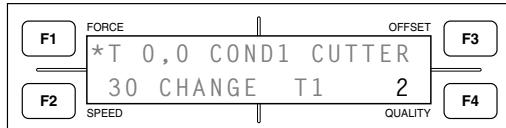
3. Use the \triangle or \square **POSITION key** to move through speed settings in the range from **1** to **60**, then select the desired value (specifically, choose from values between 0 and 10 and values in 5-step increments between 10 and 60). Press the \square **ENTER key** upon completing the settings. To continue specifying conditions, press a **function key from F_1 to F_4** to move the cursor to the setting item to be updated.

■ Setting the Quality

This setting determines the quality of the work performed. Smaller numbers for the quality setting correspond to higher quality and longer times to complete the task. For setting details, see section 3.1 “Reference Values for Cutting Conditions”.

(Default value: 4)

1. Press a **function key from F_1 to F_4** to select the COND No. Press the \square **CONDITIONS key** to display the conditions.
2. Press the F_4 **key** to move the cursor to the QUALITY area.



3. Use the \triangle or ∇ **POSITION key** to increase or decrease the quality value in the range from **1** to **6**, then select the desired value. Press the \square **ENTER key** upon completing the settings. To continue specifying conditions, press a **function key from F_1 to F_4** to move the cursor to the setting item to be updated.

3.6 Specifying Conditions When the Pen Block is Selected

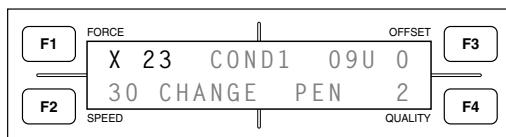
This setting determines the cutting conditions when using the pen block. Specify the conditions after selecting P (for the pen block) in the condition number to be used. (See section 3-4 “Selecting the Tangential Head or Pen Block”.)

■ Setting the Cutting Force

This setting determines the cutting force (pen force and creasing force). Here, X refers to the pen force in the X-axis direction and Y to that in the Y-axis direction. The pen force varies depending on the task angle between the X- and Y-axes. For the setting values, see section 3.1 “Reference Values for Cutting Conditions”.

(Default value: 1)

1. Press a **function key from F_1 to F_4** to select the COND No. Press the \square **CONDITIONS key** to display the conditions.
2. Press the F_1 key to move the cursor to the FORCE area.



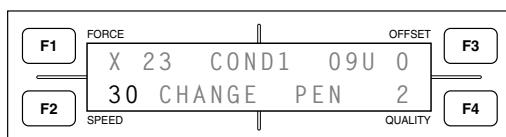
3. Use the \triangle or ∇ **POSITION key** to toggle between X and Y. Use the \triangle or ∇ **POSITION key** to move through force settings in the range from **1** to **40**, then select the desired value. Press the \square **ENTER key** upon completing the settings. To continue specifying conditions, press a **function key from F_1 to F_4** to move the cursor to the setting item to be updated.

■ Setting the Speed

This setting determines the speed. For setting values, see section 3.1 “Reference Values for Cutting Conditions”.

(Default value: 10)

1. Press a **function key from F_1 to F_4** to select the COND No. Press the \square **CONDITIONS key** to display the conditions.
2. Press the F_2 key to move the cursor to the SPEED area.



3. Use the \triangle or ∇ **POSITION key** to move through speed settings in the range from **1** to **60**, then select the desired value (specifically, choose from values between 1 and 10 and values in 5-step increments between 10 and 60). Press the \square **ENTER key** upon completing the settings. To continue specifying conditions, press a **function key from F_1 to F_4** to move the cursor to the setting item to be updated.

■ Selecting the Cutter Blade or Plotter Pen/Creasing Tool and Specifying the Offset

Follow the procedure specified below to select the type of cutter blade or the plotter pen/creasing tool and to specify the required offset for the cutter blade type. Some compensation is required, as the tips of blades mounted on the cutter plunger are not positioned along the center line; this compensation is referred to as the “cutter offset.” This cutter comes preconfigured with offset settings values for each type of cutter blade; select the offset value by choosing the blade type and fine-tuning it within the range from ± 5 . For setting values, see section 3.1 “Reference Values for Cutting Conditions”.

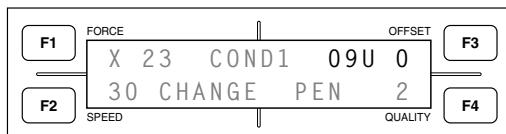
PEN : Supports use of a plotter pen - no offset value is required.

CREASER : Supports use of a creasing tool - no offset value is required.

Part number of the cutter blade (such as 09U, 15U, or OTHER)

: When using cutter blades

1. Press a **function key from F_1 to F_4** to select the COND No. Press the \square **CONDITIONS key** to display the conditions.
2. Press the F_3 **key** to move the cursor to the OFFSET area.



3. Use the \triangle or \square **POSITION key** to cycle through the cutter blade types (part numbers). Specify the desired cutter blade, plotter pen, or creasing tool. When the cutter blade is selected, the \triangle or \square **POSITION key** can be used to fine-tune the offset within the range from ± 5 .

CREASER, 09U, 15U, 15UK30, 15-10C, 15-05S, OTHER, PEN

Press the \square **ENTER key** upon completing the settings.

To continue specifying conditions, press a **function key from F_1 to F_4** to move the cursor to the setting item to be updated.

CHECKPOINT

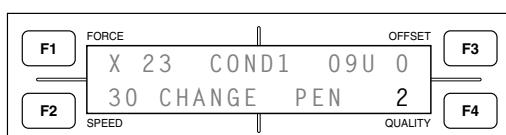
If the creasing tool is selected, press the \square **ENTER key** to display the creasing settings; continue to specify the creasing settings. (See section 3-7 “Specifying Creasing (Scoring) Conditions”.)

■ Setting the Quality

This setting determines the quality of work performed. Smaller numbers for the quality setting correspond to higher quality and longer times to complete the task. For setting details, see section 3.1 “Reference Values for Cutting Conditions”.

(Default value: 4)

1. Press a **function key from F_1 to F_4** to select the COND No. Press the \square **CONDITIONS key** to display the conditions.
2. Press the F_4 **key** to move the cursor to the QUALITY area.



3. Use the \triangle or \square **POSITION key** to increase or decrease the quality value in the range from **1** to **6**, then select the desired value. Press the \square **ENTER key** upon completing the settings. To continue specifying conditions, press a **function key from F_1 to F_4** to move the cursor to the setting item to be updated.

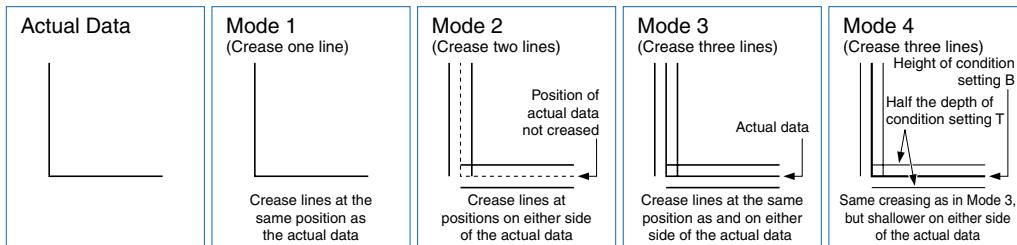
3.7 Specifying Creasing (Scoring) Conditions

The creasing tool is used to score thicker or harder media prior to folding or other processes.

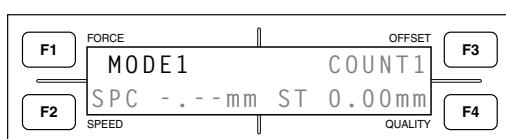
Mode Selection

Select one of the four modes specified below. Mode 4 is supported only when the tool conditions are specified as T1 or T2.

(Default value: Mode 2)



1. In the condition settings, select CREASER and press the **ENTER key** to display the settings.
2. Press the **F1** key to move the cursor to the Mode area.



3. Use the **△** or **▽ POSITION key** to cycle through the modes **from Mode1 to Mode 4** (with mode 4 available only when T1 or T2 is selected), then select the desired mode. Upon completion of the setting, press the **ENTER key**. To continue specifying conditions, press a **function key from F1 to F4** to move the cursor to the setting item to be updated.

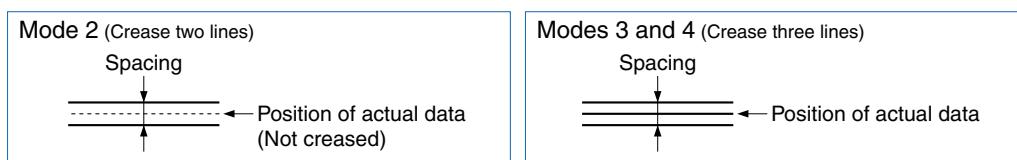


Modes 2-4 enable thick media to be bent easily.

Setting the Spacing

When modes 2-4 are selected, this setting determines the spacing between creases.

(Default value: 1 mm)



1. In the condition settings, select CREASER and press the **ENTER key** to display the settings.
2. Press the **F2** key to move the cursor to the Spacing area.
3. Use the **◀ or ▶ POSITION key** to move the cursor to the input column, then use the **△ or ▽ POSITION key** to raise or lower the value to be entered. The supported range is from **0.0** to **20.0 mm**.

Upon completion of the setting, press the  **ENTER key**. To continue specifying conditions, press a **function key from  to ** to move the cursor to the setting item to be updated.

CHECKPOINT

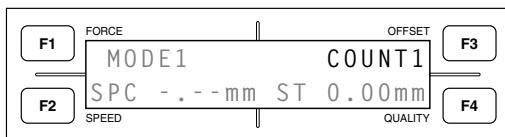
If mode 1 is selected, the cursor will not be displayed in the Spacing area even if the  key is pressed.

Setting the Count

This setting determines how many times creasing should be repeated for each line segment. Specify “1” for unidirectional creasing and “2” for double creasing.

(Default value: 2)

1. In the condition settings, select CREASER and press the  **ENTER key** to display the settings.
2. Press the  **key** to move the cursor to the Count area.

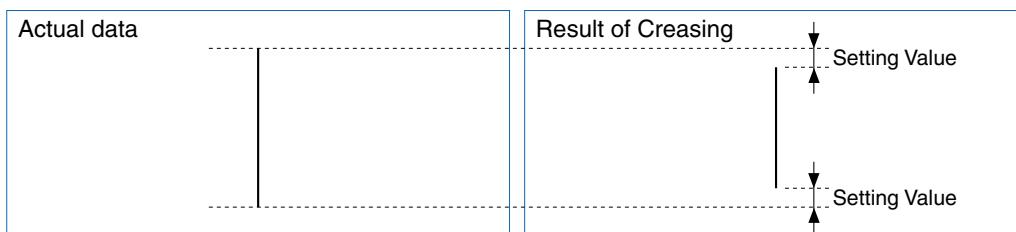


3. Use the  or  **POSITION key** to raise or lower the value to be entered within the range from **1** to **99** times. Upon completion of the setting, press the  **ENTER key**. To continue specifying conditions, press a **function key from  to ** to move the cursor to the setting item to be updated.

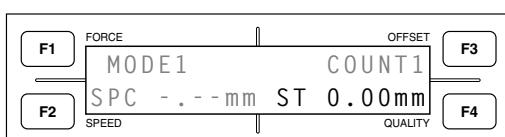
Setting the Start and End Position

This setting determines by what margin each end of the creasing line falls short of the corresponding end of the actual data line.

(Default value: 1 mm)



1. In the condition settings, select CREASER and press the  **ENTER key** to display the settings.
2. Press the  **key** to move the cursor to the Start area.



3. Use the  or  **POSITION key** to move the cursor to the input column, then use the  or  **POSITION key** to raise or lower the value to be entered within the range from **0** to **9.99 mm**. Upon completion of the setting, press the  **ENTER key**. To continue specifying conditions, press a **function key from  to ** to move the cursor to the setting item to be updated.

CHECKPOINT

For short line-segment data such as circle command, setting a large value for the Start may prevent the FC3600 from completing the task.

3.8 Specifying Optional Conditions for Short Line Segments

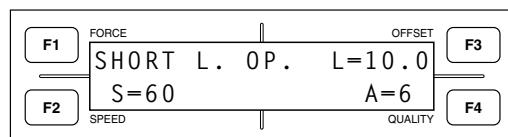
For the cutting conditions of arcs or other short line segments, the quality can be prioritized; for the cutting of long line segments such as straight lines, the speed can be prioritized to reduce overall cutting time while maintaining cutting quality. Specify the cutting conditions ("Setting the Speed/Setting the Quality" as described in page 3-8 to 3-10) for longer line segments and use these settings to specify cutting for shorter segments. For details on the numerical settings, see section 4-6 "Specifying Optional Settings for Short Lines".

(Default values: L: 1.0; SPD: 60; and ACL: 6)

CHECKPOINT

Optional conditions for short line segments are normally available when T1 or T2 is selected as the tool.

1. Press a **function key from [F1] to [F4]** to select the COND No. Press the **[] CONDITIONS key** to display the conditions.
2. After entering each condition value, press the **[] ENTER key** to display the short-line option settings.



3. Use the **[F2] to [F4] keys** to select the setting item and the **△ or ▽ POSITION key** to specify the values (see below).

L : For line segments of this value or less, SPD and ACL apply.

Setting value: **0.1 to 9.9 mm**

SPD : Maximum cutting speed

Setting value: **1 to 60**

ACL : Maximum quality

Setting value: **1 to 6**

Press the **[] ENTER key** upon completing the settings. To cancel this operation, press the **[] NEXT PAGE key**.

3.9 Setting Cutting Conditions in THICK Mode

When THICK mode is specified in the conditions, the overcutting settings must be completed. For details on THICK mode settings, see section 4.14 “Specifying THICK Mode Settings.”

CHECKPOINT

THICK mode is normally activated when T1 or T2 is selected as the tool.

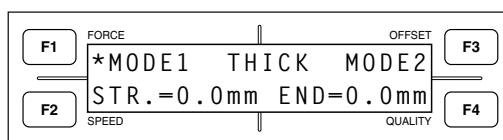
Mode Selection

Two modes are available for overcutting; choose the mode best suited for your application.
(Default value: Mode 1)

Mode 1 : Perform overcutting for the cutting start and end points and for corners with acute angles to prevent uncut areas. Compared with Mode 2, this supports finer cutting and cutting of thicker media.

Mode 2 : Perform overcutting only for the cutting start and end points. Compared with Mode 1, this supports faster cutting, since less control is required for intermediary cutting.

1. Press a **function key from F1 to F4** to select the COND No. for THICK mode. Next, press the **CONDITIONS key** to display the conditions.
2. After entering each condition value, press the **ENTER key** to display the THICK mode settings. (If short-line options are specified, conditions for short-line options are displayed first; press the **ENTER key** again to display THICK mode conditions.)



3. The active mode is indicated by an **asterisk**. Press the **F1 or F3 key** to select the desired mode. Press the **ENTER key** upon completing the settings. To specify the overcut value, press the **F2 or F4 key** to move the cursor to the setting item to be updated.

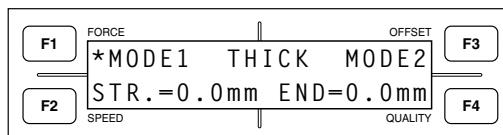
CHECKPOINT

Mode 1 is the only option when T1 or T2 is selected as the tool.

Setting Overcut Value

Follow the procedure described below to specify the overcut length for the cutting start and end points.
(Default value: Start: 0 mm; End: 0 mm)

1. Press a **function key from F1 to F4** to select the COND No. for THICK mode. Next, press the **CONDITIONS key** to display the conditions.
2. After entering each condition value, press the **ENTER key** to display the THICK mode settings.



3. Use the **F2 key** to move the cursor to the Start point area and the **F4 key** to move to the End point area. Use the **△ or ▽ POSITION key** to raise or lower the value to be entered within the range from **0 to 3.0 mm**. Press the **ENTER key** upon completing the settings. Press the **F1 or F3 key** to select the desired mode and move the cursor to the setting item to be updated.

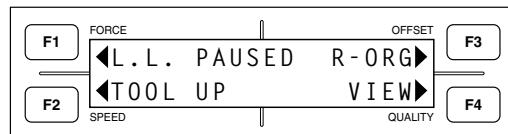
3.10 Moving the Tool Head

When the FC3600 is in READY status, use the **◀▶△▽ POSITION keys** to move the tool head in the direction indicated by the arrows. When a POSITION key is pressed initially, the tool head moves only the specified distance. If the key is held down, the tool head moves more quickly after moving the specified length (distance). The rate of movement and the length (distance) after which the tool head moves faster can be specified. See section 4.18 “Specifying the Speed of the Tool-Head”.

3.11 Stop Function

The operation can be stopped by pressing the **■ STOP key**. While stopped, the FC3600 displays the work selection menu on the control panel, allowing adjustment of the settings as needed.

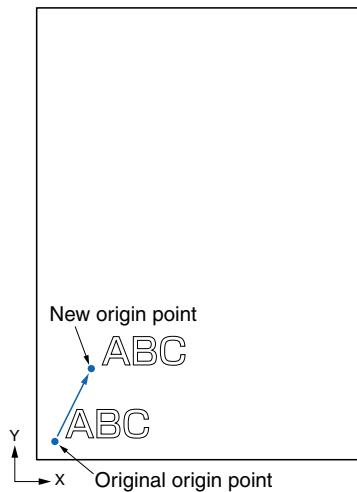
1. During operations, press the **■ STOP key** to halt operations and to display the menu shown below.



2.
 - F1 key:** Moves the tool head down and to the left
 - F2 key:** Continues tool-up operations
 - F3 key:** Rotates the cutter blade tip in the direction of the 0° position
 - F4 key:** Moves the tool head up and to the right

3.12 Specifying the Origin Point of the Work Area

The starting position can be moved freely as desired.



1. With the FC3600 in READY status, use the $\triangleleft\triangleright\triangle\triangledown$ **POSITION keys** to move the tool blade tip (pen tip) from the current condition setting to the position of the new origin point.
2. After the \oplus **ORIGIN key** is pressed, a beeping sound will be heard and the new origin point will be set.

CHECKPOINT

- After the origin point is moved, the new origin point will be initialized when the coordinate axes are rotated, MIRROR mode is activated, or the work area is selected or deselected.
- To rotate the coordinate axes or use the MIRROR mode with a new origin position, be sure to complete the ROTATE and MIRROR mode settings before specifying the origin point of the work area.
- The coordinate values displayed after a new origin point has been specified represent the relative distance of the current position from the new origin point.

■ Saving the New Origin Point (offset memory function)

When the \oplus **ORIGIN key** is pressed and held for more than one second, a beeping sound will be heard and the new origin point will be set. The new origin point will be valid even after the FC3600 is turned off.

■ Clearing the Origin Point

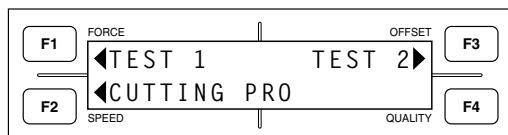
To clear the stored origin point, hold down the \oplus **ORIGIN key** while turning on the FC3600.

3.13 Running a Cutting Test (When Using the Cutter Pen)

After specifying the conditions, run a cutting test to confirm the cutting performance. Check how deeply the medium has been cut and the roundness of the cut corners. If the cutting results are unsatisfactory, specify the cutting conditions again and then run another cutting test. Repeat this process until the optimal cutting conditions have been achieved.

■ When the Blade Type is Set to Cutter, Pen, or Other

1. Load the medium to be used for cutting. Secure with the vacuum pump.
2. Press a **function key** from **F1** to **F4** to select the COND No. for the test cut.
3. Press the **▲ TEST key** to display the TEST mode menu shown below.



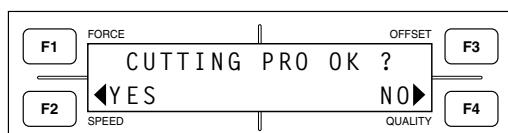
4. Using the **◀▶△▽ POSITION keys**, move the tool head to the starting position on the medium for the cutting test.
5. Press the **F1** key (**TEST 1**) to cut a single test pattern, consisting of a triangle within a square. Press the **F3** (**TEST 2**) key to cut three test patterns, each consisting of a triangle within a square with the cutting forces as follows.

First test pattern : Using a cutting force one value less than the specified value

Second test pattern: Using the specified cutting force

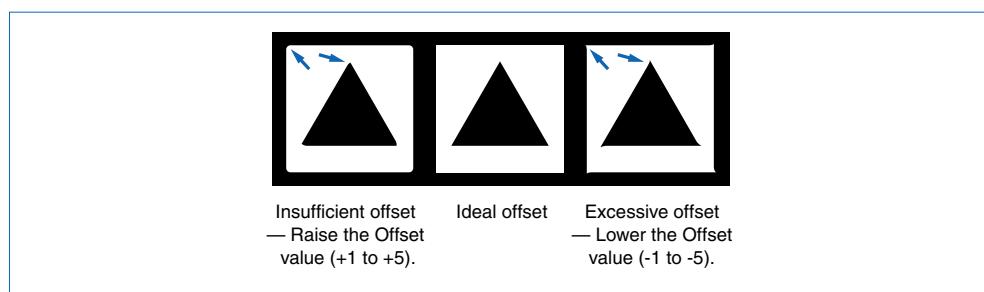
Third test pattern : Using a cutting force one value greater than the specified value

Press the **F2** (**CUTTING PRO**) key to display the CUTTING PRO prompt menu shown below.



While the above CUTTING PRO prompt menu is displayed, press the **F2** (**YES**) key to cut out the CUTTING PRO characters from the current position. To return to Step (3) instead, press the **F4** (**NO**) key.

6. Check the cut pattern(s). Peel off the four outside corners of the test patterns cut in TEST 1 or 2 to examine the corners of the inner triangle. If the corners are rounded, the offset setting is too low. Conversely, if the corners are too pointed, the offset setting is too high.

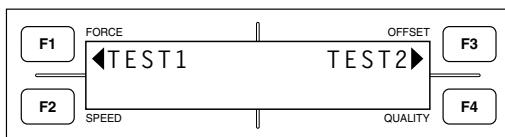


7. Next, peel off the corners of the triangle(s). Ideally, only slight traces of the cutter blade should remain on the medium base sheet. If the base sheet has been cut through, either the Force setting is too high or the cutter-blade tip is extended too far. If the base sheet shows only a few traces of the cutter blade, either the Force setting is too low or the cutter blade tip is not sufficiently extended.
8. Press the  **CONDITIONS key** to display the menu for specifying the cutting conditions, then adjust the Force and Offset settings.
9. Repeat steps (3) to (8) until satisfactory test results are achieved.
10. When the results are satisfactory, press the  **ENTER key** or  **NEXT PAGE key** to return the FC3600 to READY status.

 **CAUTION** The cutter will start moving as soon as the TEST function is selected; be sure to keep your hands and head clear of moving parts.

■ When the Blade Type is Set to CREASER

1. Load the medium for the creasing test. Secure with the vacuum pump.
2. Press a **function key** from  to  to select the testing COND No.
3. Press the  **TEST key** to display the TEST mode menu shown below.

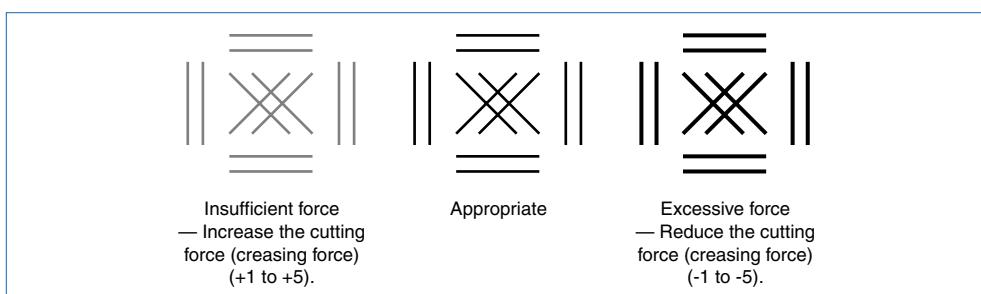


4. Using the  **POSITION keys**, move the tool head to the starting position on the medium for the test.
5. Press the  **key (TEST 1)** to crease a single test pattern. Press the  **key (TEST 2)** to crease three test patterns with different cutting (creasing) forces relative to the specified cutting force, as follows.

First test pattern : Using a cutting (creasing) force one value less than the specified value

Second test pattern : Using the specified cutting (creasing) force

Third test pattern : Using a cutting (creasing) force one value greater than the specified value
6. Check the creasing test patterns. For this check, inspect the status of the test patterns creased in test 1 or test 2. Examine how the test patterns are creased. If the pattern is only lightly creased, the creasing force is insufficient. Conversely, if the pattern is deeply creased or the medium is cut, the creasing force is excessive.

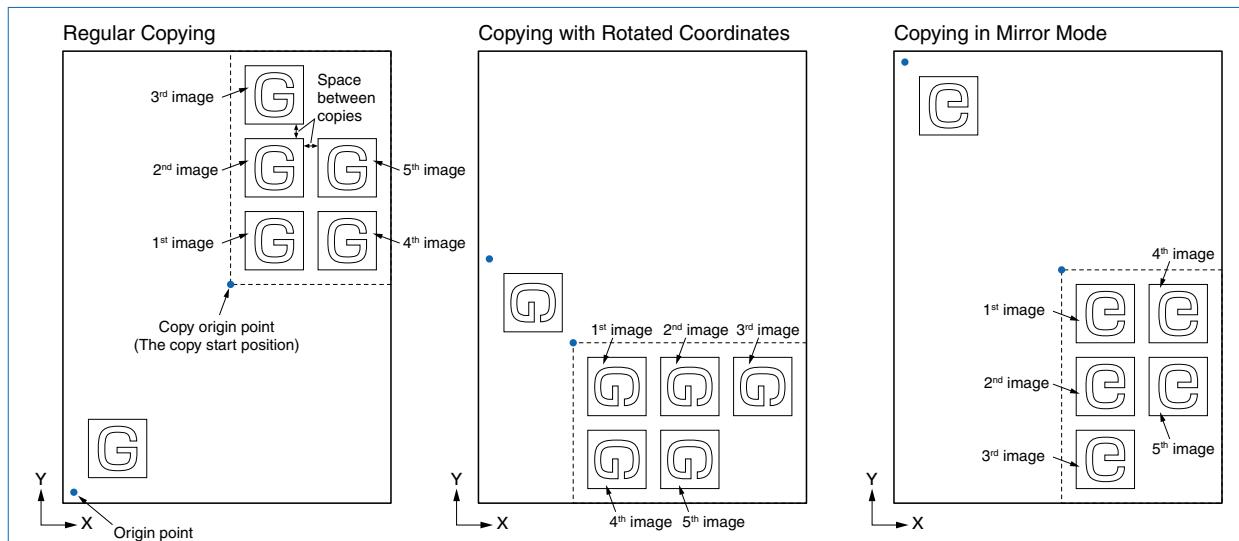


7. Press the  **CONDITIONS key** to adjust the creasing force in the condition setup menu.
8. Repeat steps (3) through (7) until the appropriate creasing is obtained.
9. When the appropriate creasing is obtained, press the  **ENTER key** or  **NEXT PAGE key** to return the FC3600 to READY status.

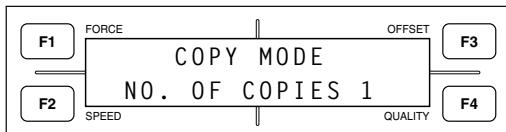
 **CAUTION** The cutter will start moving as soon as the TEST function is selected; be sure to keep your hands and head clear of moving parts.

3.14 Using the COPY Function to Work from Buffer Memory

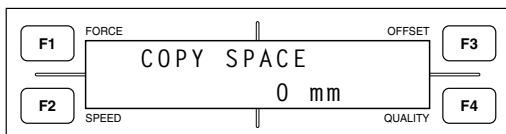
Data that has been received can be stored in the FC3600's internal buffer memory to enable multiple copies to be made for reuse in your work.



1. Perform a cutting operation using the desired data for copying.
2. Using the $\triangle\triangleright\triangle\triangledown$ **POSITION keys**, move the tool blade tip to the position on the medium at which a copy is to be made.
3. Press the **COPY key** to display COPY mode.



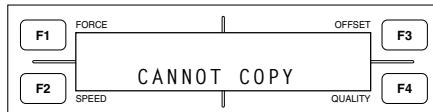
4. Use the \triangle or \triangledown **POSITION key** to specify the COUNT parameter that determines how many copies to make. The COUNT parameter cannot exceed the maximum number of copies that can be cut from one sheet of the current medium.
5. To set the copy space, press the **COPY key** to display the menu shown below.



6. Use the \triangle or \triangledown **POSITION key** to set the copy space in the range from 1 to 10 mm, then press the **ENTER key** to start copying.
7. The copy data stored in buffer memory is saved until it is cleared or until other data is received. To continue copying, replace the medium and repeat steps (2) to (6) above.



- If the data cannot be copied in the available space, the message shown below is displayed. Press the $\triangleleft\triangleright\triangle\triangledown$ POSITION keys to change the starting point for copying, or load a medium of sufficient size for the data.



- If the starting point for the work that serves as the model for copying is separated from the origin point, copying will be similarly separated. To prevent wasting medium space, start the work from as close to the origin point as possible.
- If new data is sent from the computer during copying operations, the existing data will be cleared and the cutter will function erratically. Avoid sending data during copying.
- Data larger than two megabytes (MB) in size exceeds the maximum memory capacity and cannot be used for a copy operation. (The memory size available for copy operations can be changed by adjusting the sorting settings and by other means.)

4

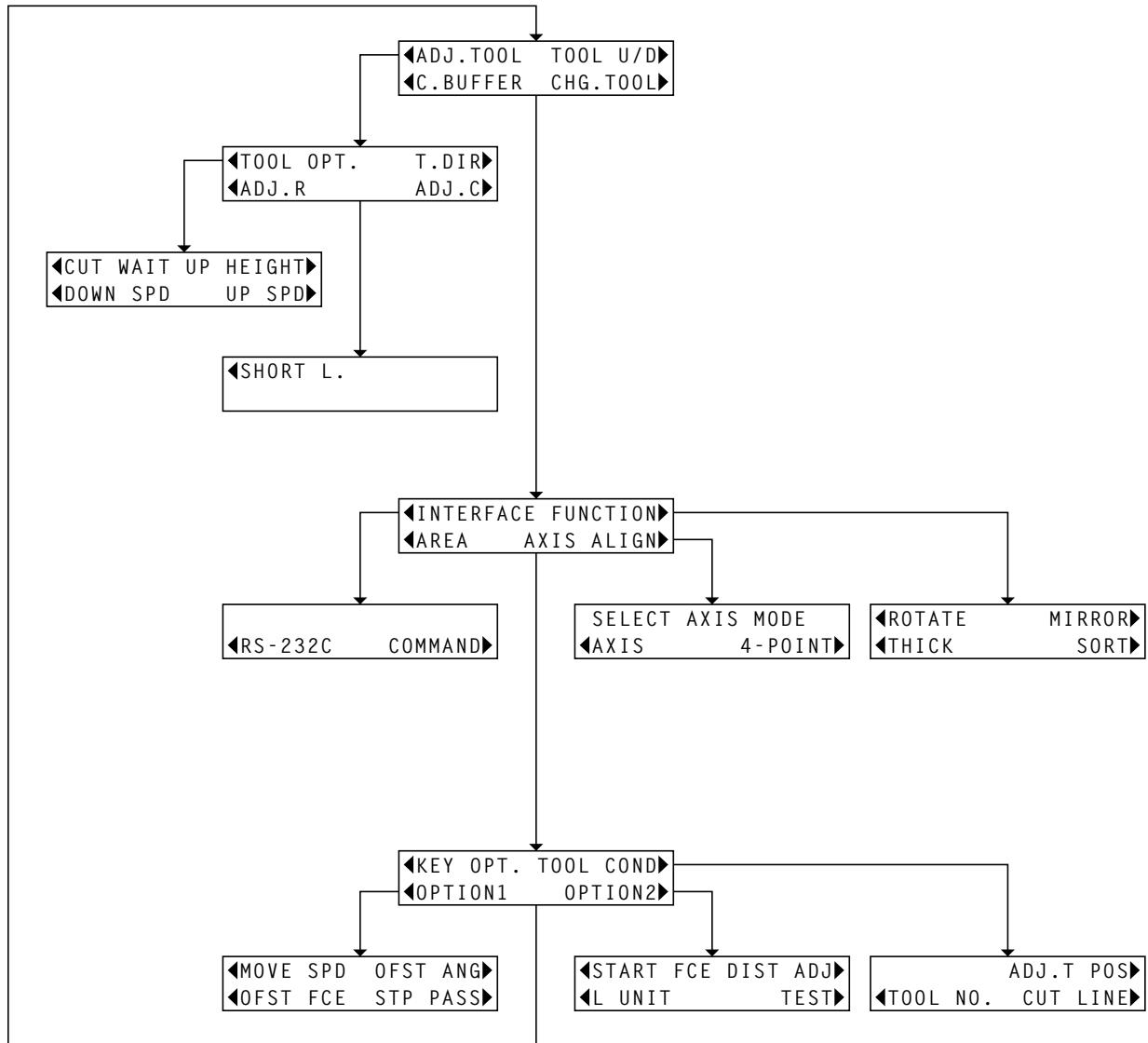
FUNCTION SETTINGS AND OPERATIONS

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4.1 Menu Mode at a Glance

The **PAUSE** key can be pressed when the FC3600 is in READY status to put the unit offline while various settings in MENU mode are completed. Scroll to different menus by pressing the **NEXT PAGE** key or one of the **function keys** (**F1** to **F4**).



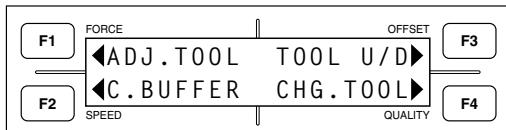
4.2 Setting the Tangential Head

These settings are available when using the tangential head.

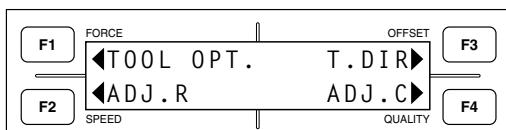
■ Setting Tool-Down Standby Time

This setting determines the standby time between when the tool is lowered and when cutting begins. The setting also applies to the standby time when the value of U (length without cutting) is set to "0" in the perforation settings. For details, see section 4.25 "Setting Perforation".

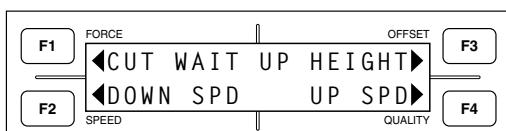
1. Press the **PAUSE** key to put the FC3600 offline.
2. Press the **NEXT PAGE** key repeatedly until the following menu is displayed.



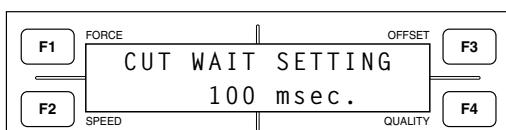
3. Press the **F1** key (ADJ. TOOL) to display the menu shown below.



4. Press the **F1** key (TOOL OPT.) to display the menu shown below.



5. Press the **F1** key (CUT WAIT) to display the setting for standby after the tool is lowered.



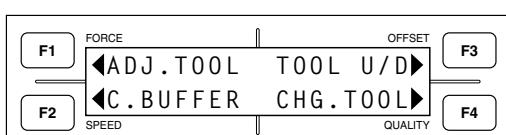
6. Use the **△** or **▽** POSITION key to increase or decrease the value in the range from 0 to 1000 msec, and press the **ENTER** key to select the desired value. To cancel setup, press the **NEXT PAGE** key.
7. Press the **PAUSE** key to put the FC3600 online again.

■ Setting the Tool-Down Speed

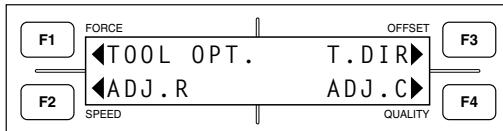
These settings determine the tool-down speed and rate of acceleration.

(Default value: Speed: 15 cm/s; Acceleration: 6)

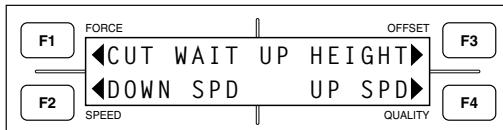
1. Press the **PAUSE** key to put the FC3600 offline.
2. Press the **NEXT PAGE** key repeatedly until the following menu is displayed.



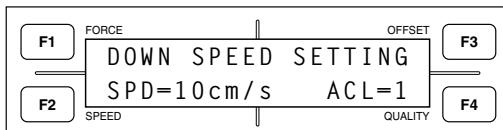
3. Press the **F1** key (ADJ. TOOL) to display the menu shown below.



4. Press the **F1** key (TOOL OPT.) to display the menu shown below.



5. Press the **F2** key (CUT SPEED) to display the setting for the tool-down speed.



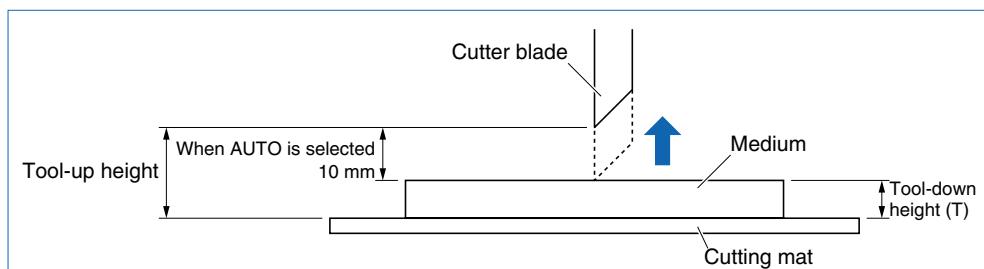
6. To make the speed setting, press the **F2** key to move the cursor to the Speed area. Use the **△** or **▽** POSITION key to increase or decrease the value in the range from 1 to 15 cm/s until the desired value is reached. For the acceleration setting, press the **F4** key to move the cursor to the Acceleration area. Use the **△** or **▽** POSITION key to increase or decrease the value in the range from 1 to 6. After specifying both values, press the **ENTER** key to confirm your choices. To cancel setup, press the **NEXT PAGE** key.

7. Press the **PAUSE** key to put the FC3600 online again.

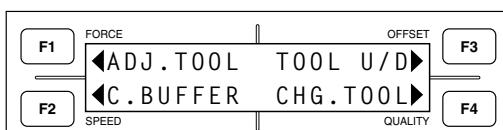
■ Setting the Tool-Up Height

This setting determines the cutting tool height when the tool is raised, with the value specified here being the height from the cutting mat. Note that when AUTO is selected, a different height applies for the cutting machine, depending on the T setting for the tool-down height. For details, see section 3.5 “Specifying Conditions When the Tangential Head is Selected”.

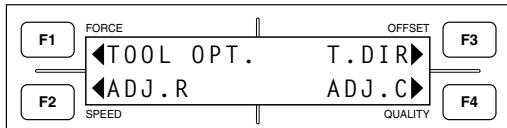
(Default value: 62 mm)



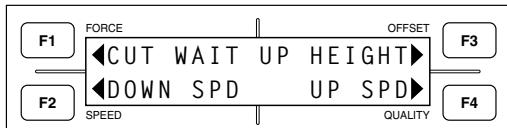
1. Press the **PAUSE** key to put the FC3600 offline.
2. Press the **NEXT PAGE** key repeatedly until the following menu is displayed.



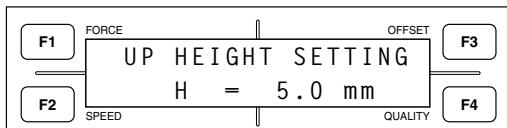
3. Press the **F1** key (ADJ. TOOL) to display the menu shown below.



4. Press the **F1** key (TOOL OPT.) to display the menu shown below.



5. Press the **F3** key (UP HEIGHT) to display the tool-up height setting.



6. Use the Δ or ∇ POSITION key to move through 5 (+T) to 62 mm, and AUTO. Press the **ENTER** key to select the desired value. To cancel setup, press the **NEXT PAGE** key.

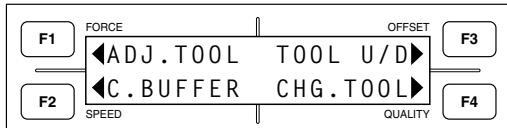
7. Press the **PAUSE** key to put the FC3600 online again.

■ Setting the Tool-Up Speed

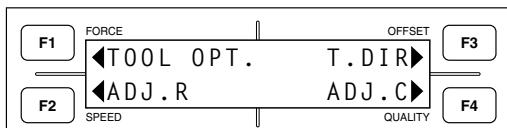
This setting determines the tool-up speed and rate of acceleration.

(Default value: Speed: 15 cm/s; Acceleration: 6)

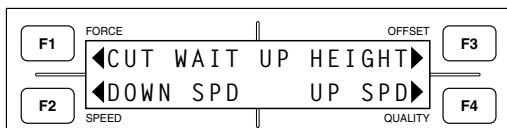
1. Press the **PAUSE** key to put the FC3600 offline.
2. Press the **NEXT PAGE** key repeatedly until the following menu is displayed.



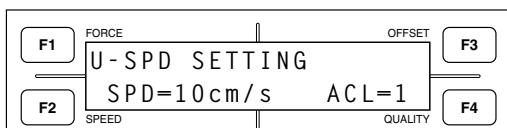
3. Press the **F1** key (ADJ. TOOL) to display the menu shown below.



4. Press the **F1** key (TOOL OPT.) to display the menu shown below.



5. Press the **F4** key (U-SPD) to display the tool-up speed setting.

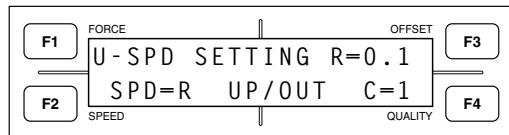


6. For the speed setting, press the **F2** key to move the cursor to the Speed area. Use the **△** or **▽ POSITION key** to increase or decrease the value in the range from **1** to **15 cm/s** until the desired value is reached or to select **R**.

R: When the cutter blade is stuck fast in the medium to be cut, this option oscillates the cutter blade as the tool is raised in order to prevent the previously cut medium from flying up with the cutter blade.

For the acceleration setting, press the **F4** key to move the cursor to the Acceleration area. Use the **△** or **▽ POSITION key** to increase or decrease the value in the range from **1** to **6**. After specifying both values, press the **ENTER key** to confirm your choices. To cancel setup, press the **NEXT PAGE key**.

7. If **R** is selected as the acceleration setting, the menu shown below is displayed for the cutter blade oscillation angle and frequency settings.



8. For the oscillation angle setting, press the **F3** key to move the cursor to the R area. Use the **△** or **▽ POSITION key** to increase or decrease the value in the range from **0.1°** to **6.0°** until the desired value is reached. For the acceleration setting, press the **F4** key to move the cursor to the C area. Use the **△** or **▽ POSITION key** to increase or decrease the value in the range from **1** to **9** (with a value of **1** being equivalent to **10** oscillation cycles). After specifying both values, press the **ENTER key** to confirm your choices. To cancel setup, press the **NEXT PAGE key**.

9. Press the **PAUSE key** to put the FC3600 online again.

4.3 Correcting the Blade Tip Position

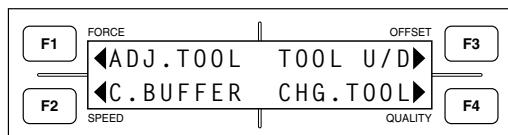
Misalignment of the center of the blade tip, which may occur when different types of blades are used, can be corrected.

1. Load the medium to be used for test cutting. Secure with the vacuum pump.
2. Press a **function key from F1 to F4** to select the COND No. of the tangential head (T1 or T2) for correction.
3. Using the **◀▶△▽ POSITION keys**, move the blade tip of the tool selected in the current settings to the starting position on the medium for the cutting test.

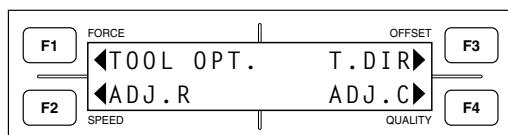
CHECKPOINT

Perform test cutting near the position specified in the T setting (the medium surface) in the tool height settings, as described on page 3-7.

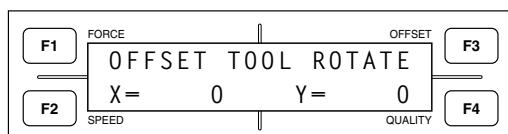
4. Press the **PAUSE key** to put the FC3600 offline.
5. Press the **NEXT PAGE key** repeatedly until the following menu is displayed.



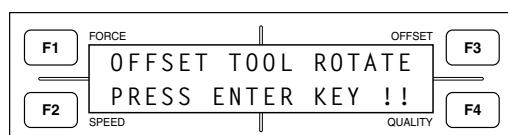
6. Press the **F1 key (ADJ. TOOL)** to display the menu shown below.



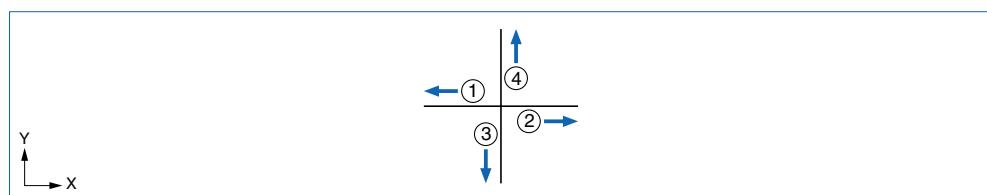
7. Press the **F2 key (ADJ. R)** to display the setting for correcting the blade tip position.



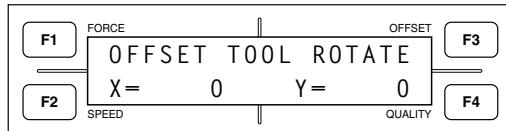
8. Press the **TEST key** to display the menu shown below.



9. Press the **ENTER key** to start the test and delineate a "+" symbol outward from the center.



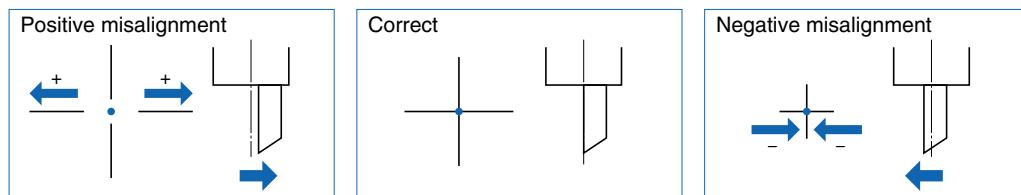
10. Upon completion of marking, the display returns to the menu for correction of the blade tip position.



11. For the X axis, enter the offset value relative to the center. For the Y axis, enter the offset value for misalignment of the blade when it is rotated 180°. Use the **F2** and **F4** keys to move the cursor to the X and Y areas, respectively. Use the \triangle or ∇ **POSITION key** to increase or decrease the values in the range from -3 to 3 mm. After specifying offset values, press the **ENTER key** to confirm your choices. To cancel correction, press the **NEXT PAGE key**.

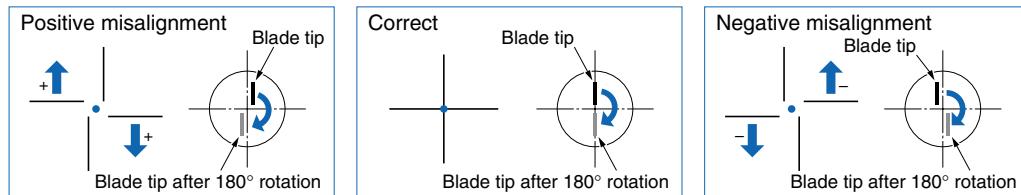
X-Direction Adjustment

If misalignment is observed in lines of the same axis of the “+” symbol, correct the position relative to the center.



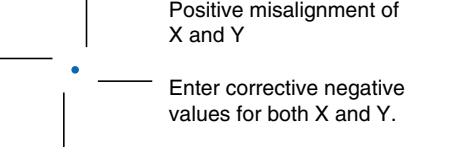
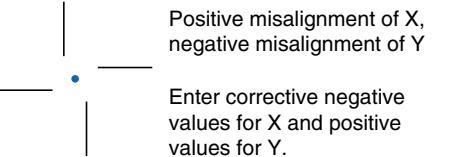
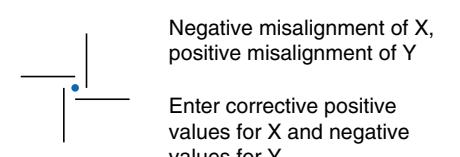
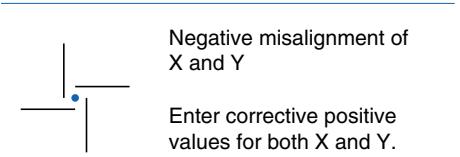
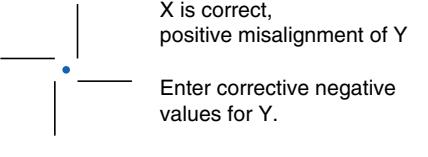
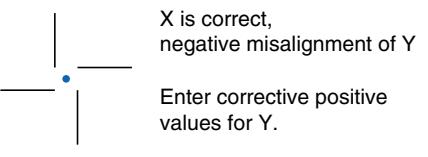
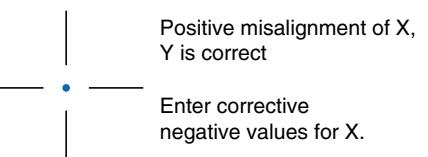
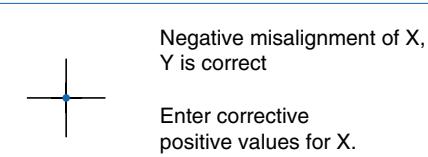
Y-Direction Adjustment

If misalignment is observed in lines of the same axis of the “+” symbol, correct the blade position when it is rotated 180°.



Reference 1

Blade tip misalignment falls into one of the following eight categories.

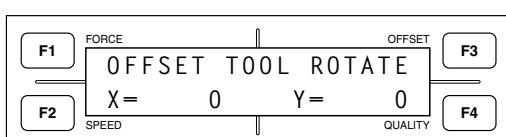
	Positive misalignment of X and Y Enter corrective negative values for both X and Y.
	Positive misalignment of X, negative misalignment of Y Enter corrective negative values for X and positive values for Y.
	Negative misalignment of X, positive misalignment of Y Enter corrective positive values for X and negative values for Y.
	Negative misalignment of X and Y Enter corrective positive values for both X and Y.
	X is correct, positive misalignment of Y Enter corrective negative values for Y.
	X is correct, negative misalignment of Y Enter corrective positive values for Y.
	Positive misalignment of X, Y is correct Enter corrective negative values for X.
	Negative misalignment of X, Y is correct Enter corrective positive values for X.

12. Perform another test and repeat the correction process until a correct "+" symbol is achieved.
13. Press the  PAUSE key to put the FC3600 online again.

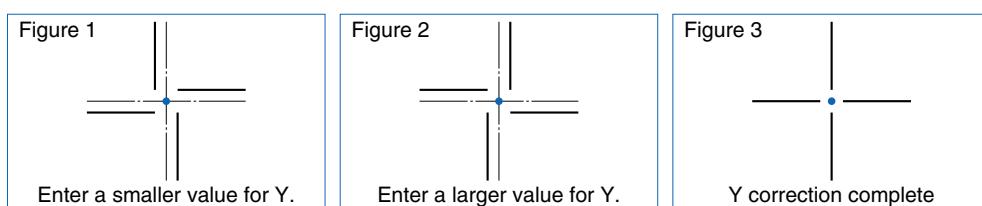
Reference 2

Follow the procedure described below for an easier means of correcting the blade tip position.

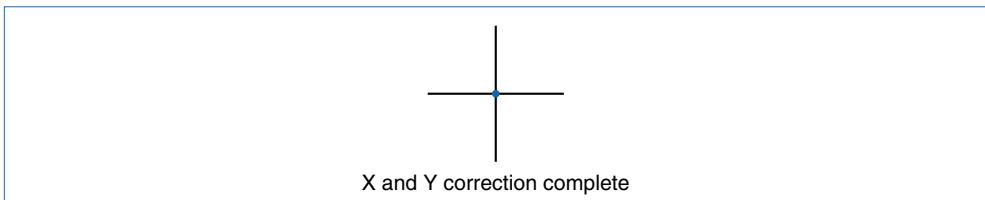
1. In the menu for correcting the blade tip position, enter X = 0.3 and Y = 0.0. Delineate the "+" symbol.



2. If the results of cutting match Figure 1, enter a smaller value for Y. If the results match Figure 2, enter a larger value for Y. Continue adjusting the Y offset value until the results match Figure 3.



3. Upon completion of Y correction, enter a smaller offset value for X and repeat the correction process until the results match the figure shown below.



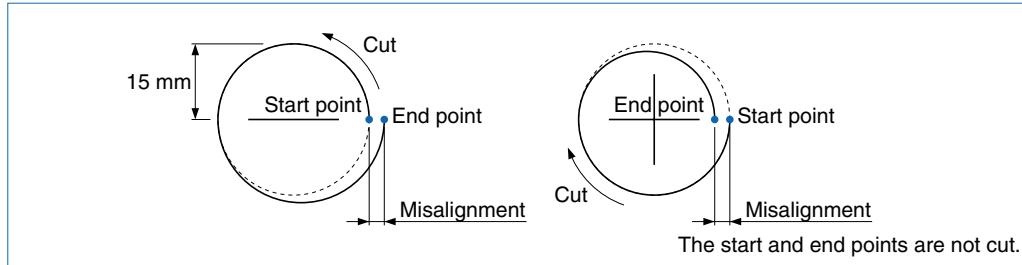
4.4 Correcting the Blade Tip Orientation

Slight misalignment of the blade tip orientation can be corrected.

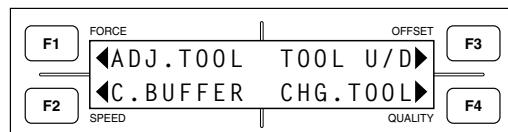
CAUTION If the blade is incorrectly oriented by a significant margin, the resistance of the medium during cutting may bend the blade.

■ Correction by Cutting a Circle

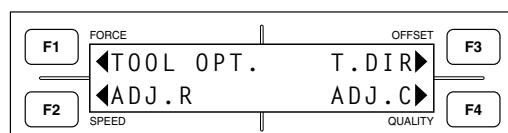
Cut two circles, one clockwise and the other counterclockwise, and correct misalignment of the start and end points.



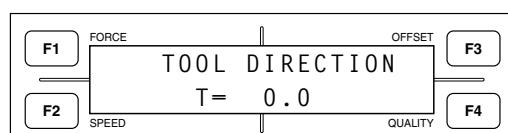
1. Load the medium to be used for test cutting. Secure with the vacuum pump.
2. Press a **function key** from **F1** to **F4** to select the COND No. of the tangential head (T1 or T2) for correction.
3. Press the **PAUSE** key to put the FC3600 offline.
4. Press the **NEXT PAGE** key repeatedly until the following menu is displayed.



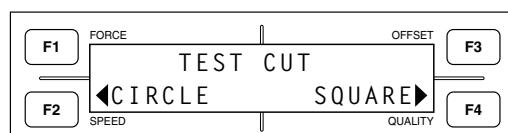
5. Press the **F1** key (**ADJ. TOOL**) to display the menu shown below.



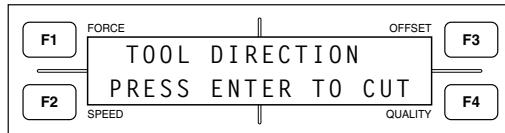
6. Press the **F3** key (**T. DIR**) to display the setting for correcting the blade tip orientation.



7. Press the **TEST** key to display the menu shown below for test cutting selection.

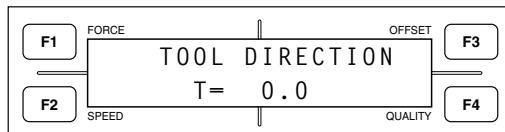


8. Press the **F2** key (**CIRCLE**) to display the menu for starting test cutting.

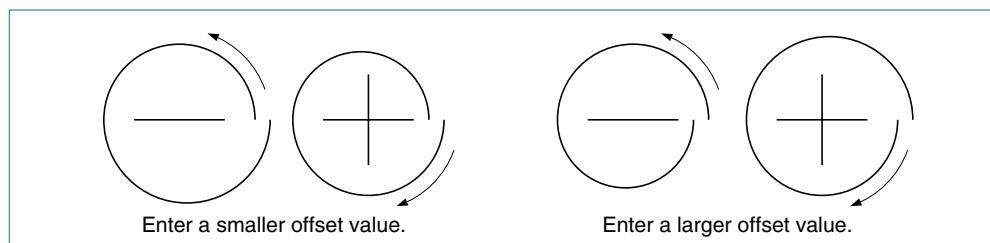


9. Using the **◀▶△▽ POSITION keys**, move the blade tip (pen tip) of the tool selected in the current settings to the starting position on the medium for the cutting test. Press the **ENTER** key to start the cutting test.

10. Upon completion of the test, the menu for entering corrections of the blade tip orientation is displayed.



11. Use the **△ or ▽ POSITION key** to increase or decrease the values in the range from **-5.0°** to **5.0°**. Refer to the figure shown below when entering offset values; after specifying the values, press the **ENTER** key to confirm your choice. To cancel correction, press the **NEXT PAGE** key.



12. Perform another test and repeat the correction process until there is minimal misalignment in the left and right circles.

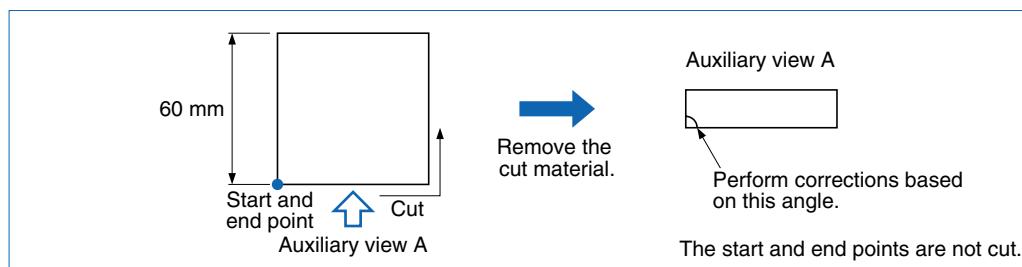
CHECKPOINT

When the start and end points for two circles fail to coincide, remember to specify offset values for minimal misalignment of the start and end points for both circles, rather than for the alignment of one circle only.

13. Press the **PAUSE** key to put the FC3600 online again.

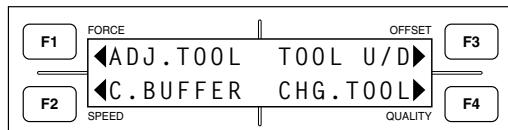
■ Correction by Cutting a Square (for longer blades)

Cut a square out of the medium and perform corrections based on the side angles. If the blade is incorrectly oriented by a significant margin, the resistance of the medium when cutting thicker media may bend the blade and prevent straight cutting of the media.

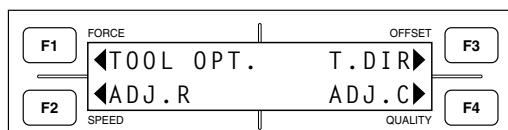


1. Load the medium that will be used for test cutting. Secure with the vacuum pump.

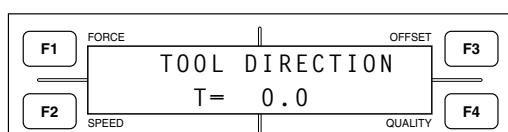
2. Press a **function key from F1 to F4** to select the COND No. of the tangential head (T1 or T2) for correction.
3. Press the **PAUSE key** to put the FC3600 offline.
4. Press the **NEXT PAGE key** repeatedly until the following menu is displayed.



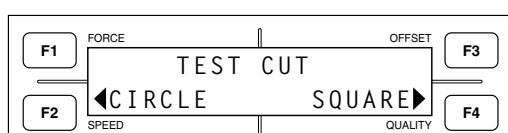
5. Press the **F1 key (ADJ. TOOL)** to display the menu shown below.



6. Press the **F3 key (T. DIR)** to display the setting for correcting the blade tip orientation.



7. Press the **TEST key** to display the menu shown below for test cutting selection.



8. Press the **F4 key (SQUARE)** to display the menu for starting test cutting.



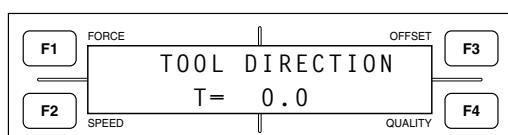
9. Using the **POSITION keys**, move the blade tip (pen tip) of the tool selected in the current settings to the starting position on the medium for the cutting test. Press the **ENTER key** to start the cutting test. Take a square out of the medium and measure the side angle.

CHECKPOINT

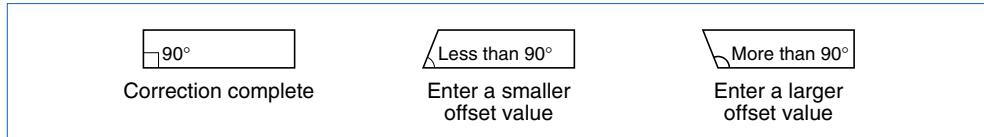
A commercially available drafting triangle can be used to perform a more accurate check. Rubber media is often warped, so check it on a flat surface, being sure to hold it down from above.



10. Upon completion of the test, press the **NEXT PAGE key** to display the menu for entering corrections for the blade tip orientation.



11. Use the \triangle or ∇ **POSITION key** to increase or decrease the values in the range from -5.0° to 5.0° . Refer to the figure shown below when entering offset values. After specifying the values, press the  **ENTER key** to confirm your choice. To cancel a correction, press the  **NEXT PAGE key**.



12. Perform another test and repeat the correction process until the side angle is 90° .

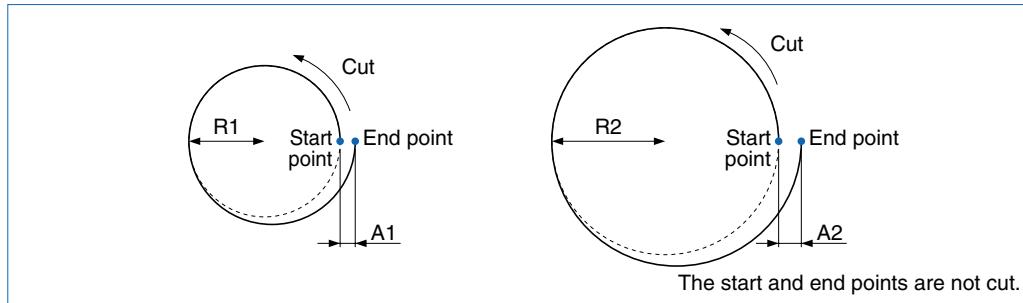
13. Press the  **PAUSE key** to put the FC3600 online again.

4.5 Correcting Circles

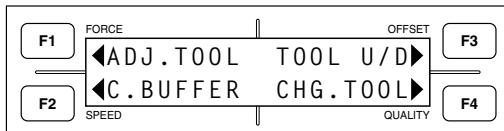
The circle command can be used to correct distortion in circles by aligning the start and end points.

■ Circle Command Correction

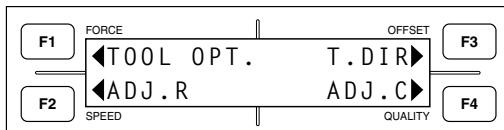
Cut two circles of different sizes and perform correction based on the misalignment value (A1 or A2) and the proportion of the circle radii (R1 or R2).



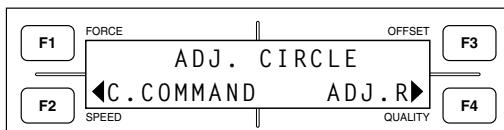
1. Load the medium that will be used for test cutting. Secure with the vacuum pump.
2. Press a **function key** from **F1** to **F4** to select the COND No.
3. Press the **PAUSE** key to put the FC3600 offline.
4. Press the **NEXT PAGE** key repeatedly until the following menu is displayed.



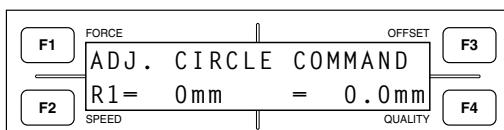
5. Press the **F1** key (**ADJ. TOOL**) to display the menu shown below.



6. Press the **F4** key (**ADJ. C**) to display the setting for correcting circles.

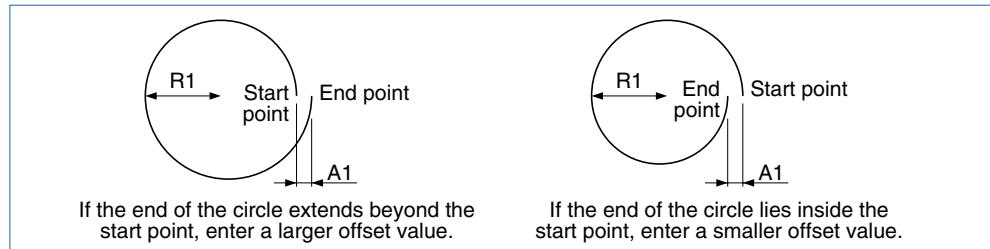


7. Using the **POSITION keys**, move the blade tip (pen tip) of the tool selected in the current settings to the starting position on the medium for the cutting test.
8. Press the **F2** key (**C. COMMAND**) to cut two circles of different sizes; the first circle command menu for circle correction is displayed.



9. For R1, enter the circle radius (radius data). For A1, enter the amount of misalignment between the start and end points. Press the **F2** and **F4** key to move the cursor to the R1 and A1 areas, respec-

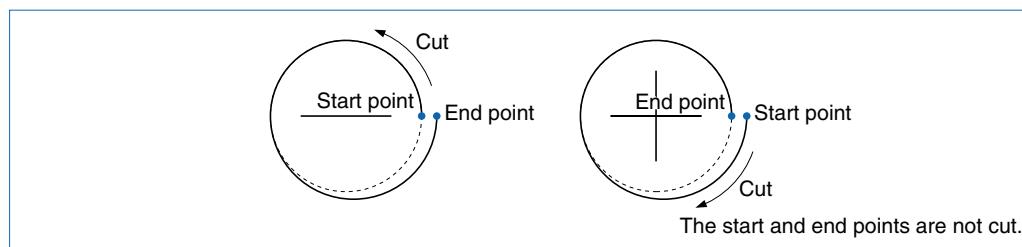
tively. Use the or **POSITION key** to increase or decrease the values. After specifying the values, press the **ENTER key** to confirm your choices.



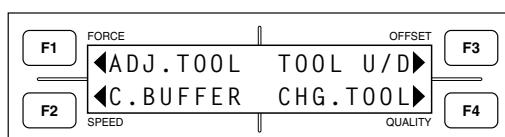
10. Continue to the second circle command menu for correction and repeat this process.
11. Perform another test and repeat the correction process until the circle start and end points are aligned.
12. Press the **PAUSE key** to put the FC3600 online again.

■ Rotation Correction

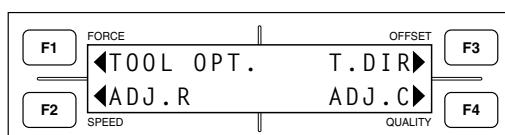
Cut two circles clockwise and counterclockwise and perform corrections based on the proportion of line segment misalignment.



1. Load the medium to be used for test cutting. Secure with the vacuum pump.
2. Press the **PAUSE key** to put the FC3600 offline.
3. Press the **NEXT PAGE key** repeatedly until the following menu is displayed.



4. Press the **key (ADJ. TOOL)** to display the menu shown below.

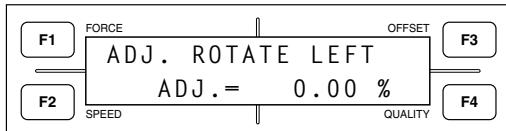


5. Press the **key (ADJ. C)** to display the setting for correcting circles.

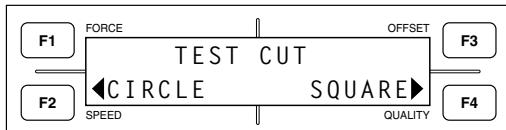


6. Using the **POSITION keys**, move the blade tip (pen tip) of the tool selected in the current settings to the starting position on the medium for the cutting test.

7. Press the **F4** key (ADJ. R) to display the correction menu for counterclockwise rotation.

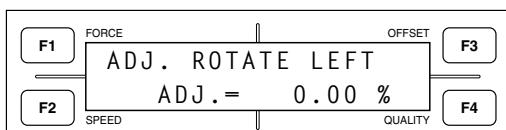


8. Press the **▲ TEST** key to display the menu shown below for test cutting selection.



9. Press the **F2** key (CIRCLE) to cut two circles with different rotation directions (clockwise and counterclockwise).

10. Upon completion of the test, press the **NEXT PAGE** key to display the menu for entering corrections for counterclockwise rotation.



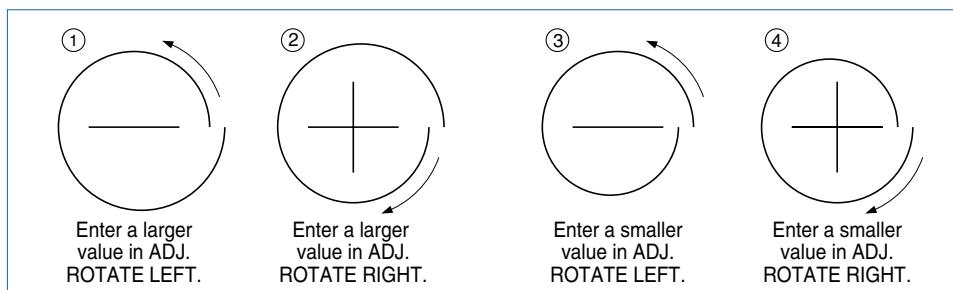
11. Use the **△** or **▽** POSITION key to increase or decrease the values. Refer to the figure shown below when entering offset values. After specifying the values, press the **ENTER** key to confirm your choice. Continue to the menu for entering corrections for clockwise rotation and repeat this process. To cancel corrections, press the **NEXT PAGE** key.

- **Counterclockwise correction**

If the cutting results match ①, enter a larger value in the ADJ. ROTATE LEFT area. If the cutting results match ③, enter a smaller value. Repeat the correction process until the start and end points are aligned. Aim for incremental corrections of 25% to 30% until the points are nearly aligned, then perform fine-tuning by entering offset values in 1% increments.

- **Clockwise correction**

If the cutting results match ②, enter a larger value in the ADJ. ROTATE RIGHT area. If the cutting results match ④, enter a smaller value. Repeat the correction process until the start and end points are aligned. Aim for incremental corrections of 25% to 30% until the points are nearly aligned, then perform fine-tuning by entering offset values in 1% increments.



CHECKPOINT

In some cases, the cutting results will be a combination of ① and ④ or ② and ③.

CAUTION

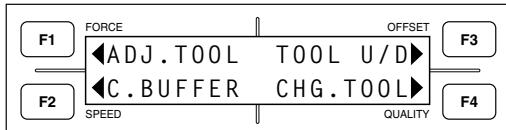
Corrections made with excessive force may cause notches on the finished surface.

12. Press the **PAUSE** key to put the FC3600 online again.

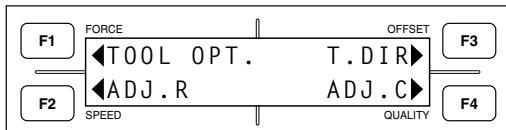
4.6 Specifying Optional Settings for Short Lines

This setting determines optional settings when the two different conditions are required within the same cutting task, such as a slower cutting speed for arcs or other short line segments and a faster cutting speed for straight lines. For details on specifying optional conditions for short line segments, see section 3.8 "Specifying Optional Conditions for Short Line Segments".

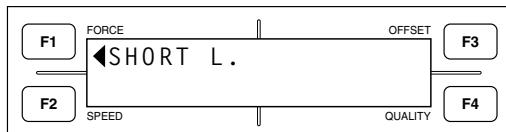
1. Press the  **PAUSE key** to put the FC3600 offline.
2. Press the  **NEXT PAGE key** repeatedly until the following menu is displayed.



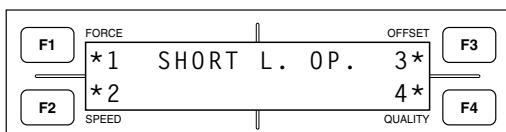
3. Press the  **key (ADJ. TOOL)** to display the menu shown below.



4. Press the  **NEXT PAGE key** to display the menu shown below.



5. Press the  **key (SHORT L.)** to display the settings menu for short line segment options.

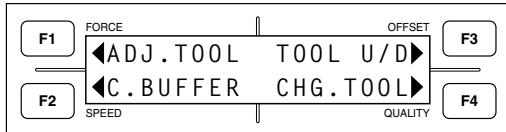


6. The numbers 1 to 4 represent condition numbers. Those with short line segment options specified are marked with an **asterisk**. Press the  **or**  **key** to place or remove an **asterisk** to turn the feature on and off for each condition number.
7. Press the  **PAUSE key** to put the FC3600 online again.

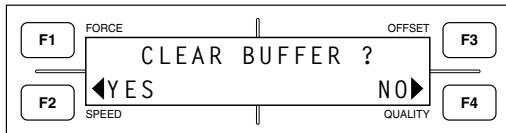
4.7 Clearing Data from the Internal Buffer Memory

This function clears the internal memory of data sent from the computer. Use this function to discontinue a cutting operation in progress.

1. Press the  **PAUSE key** to put the FC3600 offline.
2. Press the  **NEXT PAGE key** repeatedly until the following menu is displayed.



3. Press the  **key (C. BUFFER)** to display the prompt shown below.

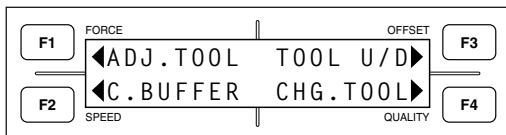


4. To clear existing data from memory, press the  **(YES) key**. If you do not wish to clear the data, press the  **(NO) key** or the  **NEXT PAGE key**.
5. Press the  **PAUSE key** to put the FC3600 online again.

4.8 Raising or Lowering the Tool

The TOOL U/D function is used for raising or lowering the tool.

1. Press the  **PAUSE key** to put the FC3600 offline.
2. Press the  **NEXT PAGE key** repeatedly until the following menu is displayed.

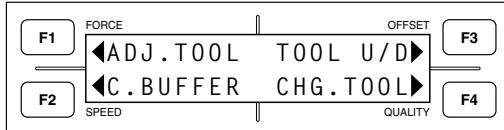


3. Here, each time the  **key (TOOL U/D)** is pressed, the cutting tool will be raised or lowered.
4. Press the  **PAUSE key** to put the FC3600 online again.

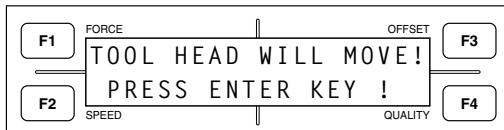
4.9 Changing the Tool

Follow the procedure specified below to change the cutting tool.

1. Press the  **PAUSE key** to put the FC3600 offline.
2. Press the  **NEXT PAGE key** repeatedly until the following menu is displayed.



3. Press the  **key (CHG. TOOL)** to display the menu shown below.



4. After the  **ENTER key** is pressed, the tool head moves to a position for changing tools and the message shown below is displayed.

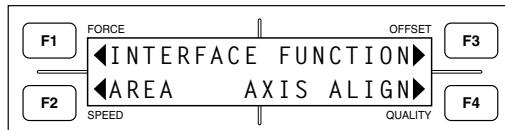


5. Turn off the FC3600 before changing the tool.

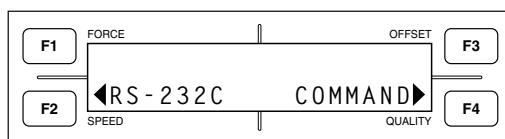
4.10 Specifying the Communication Conditions

When the FC3600 is connected via an RS-232C cable to a computer, be sure to set identical communication conditions in the software and OS communication settings for the data transfer rate (baud rate), data length, and parity. This section describes the settings on the plotter side. For setting instructions for the software and OS side, consult the respective user's manuals. Three groups of communication settings can be completed, allowing you to switch to a different group of settings in a single operation.

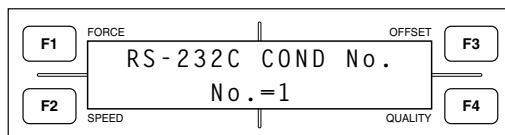
1. Press the **PAUSE** key to put the FC3600 offline.
2. Press the **NEXT PAGE** key repeatedly until the following menu is displayed.



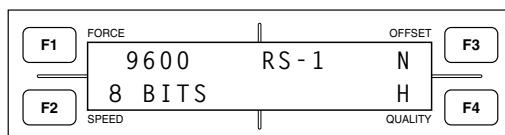
3. Press the **F1** key (**INTERFACE**) to display the menu shown below.



4. Press the **F2** key (**RS-232C**) to display the menu for selection of the communication settings group.



5. The group numbers are displayed in the bottom row. Use the **△** or **▽** **POSITION key** to select group 1, 2, or 3. After selecting the desired group No., press the **ENTER** key to confirm your choice. The communication conditions settings are displayed.



6. Here, **F1** shows the current transfer rate (baud rate), **F2** the data length, **F3** the parity, and **F4** the handshake setting. Use **function keys** **F1** to **F4** to select the desired item, then use the **△** or **▽** **POSITION key** to select item details (see below). Make sure the setting details at the FC3600 are identical with the software or OS settings.

Baud rate : 19200, 9600, 4800, 2400, 1200, 600, and 300 bps

Parity : N (none), E (even), O (odd)

Data length : 7 BITS, 8 BITS

Handshake : H (hardwire), X (X-on/X-off), E (ENQ/ACK; selectable in HP-GL command mode only)

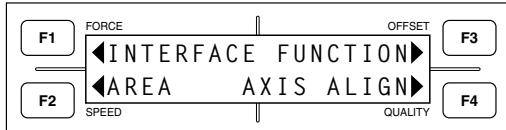
After completing each setting item, press the **ENTER** key to confirm your choices. To cancel this operation, press the **NEXT PAGE** key.

7. Press the **PAUSE** key to put the FC3600 online again.

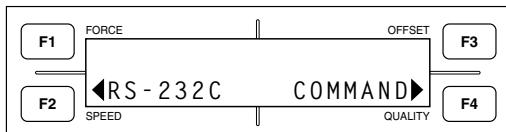
4.11 Specifying the Data Format to be Received

Before data is sent from the computer, the FC3600 must be set to recognize the data format (command mode) sent by the software. The FC3600 supports two data formats (command modes): GP-GL (Graphtec commands) or HP-GL commands. Select the command mode best suited for your application.

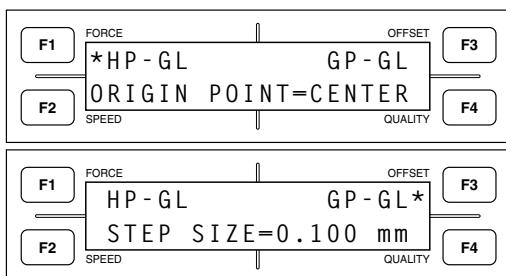
1. Press the  **PAUSE key** to put the FC3600 offline.
2. Press the  **NEXT PAGE key** repeatedly until the following menu is displayed.



3. Press the  **key (INTERFACE)** to display the menu shown below.



4. Press the  **key (COMMAND)** to display the menu shown below.

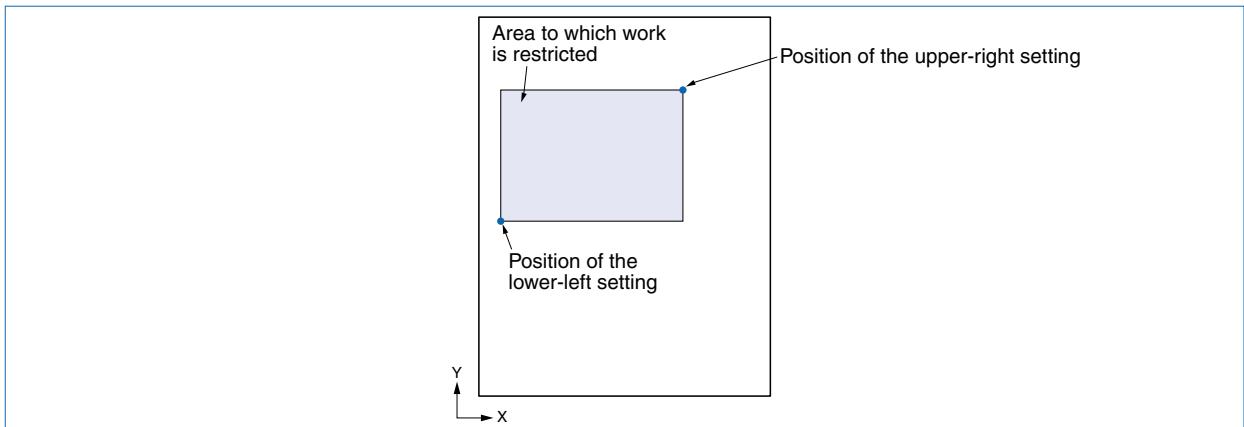


5. The active mode is indicated by an **asterisk**. Press the  or  **key** to select the desired mode. If HP-GL is selected, specify the origin point. Use the  or  **POSITION key** to toggle the display between **CENTER** and **L.L. (lower left)**. After selecting the desired origin point, press the  **ENTER key** to confirm your choice.
If **GP-GL** is selected, specify the step size. Use the  or  **POSITION key** to cycle the value through **0.100**, **0.050**, **0.025**, and **0.010 mm**. After selecting the desired value, press the  **ENTER key** to confirm your choice.
To cancel setup, press the  **NEXT PAGE key**.

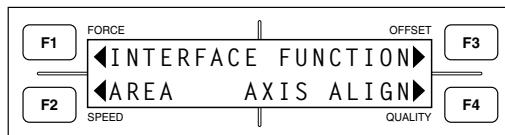
6. Press the  **PAUSE key** to put the FC3600 online again.

4.12 Specifying the Work Area

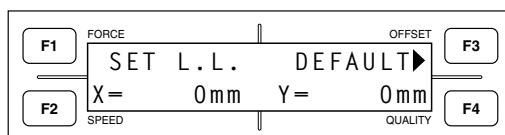
The work area can be specified to keep work from being performed outside the designated area. This function encourages efficient use of media by avoiding unavailable (already occupied) areas of media. When a different cutting area is specified, the origin point is repositioned accordingly.



1. Press the **PAUSE** key to put the FC3600 offline.
2. Press the **NEXT PAGE** key repeatedly until the following menu is displayed.



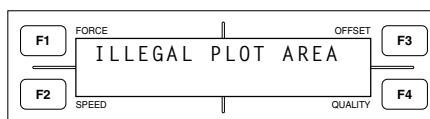
3. Press the **F2** key (AREA) to display the work area settings menu shown below.



4. Use the **POSITION keys** to move the tool blade tip (pen tip) from the current condition setting to the lower-left position of the work area to be designated. Press the **ENTER** key to display the specified coordinates of the lower-left point. To apply the default value, press the **F3** key.
5. Upon completion of the lower-left setting, the upper-right position coordinates are displayed. Follow the same procedure as for the lower-left setting to complete the settings.
6. Press the **PAUSE** key to put the FC3600 online again.

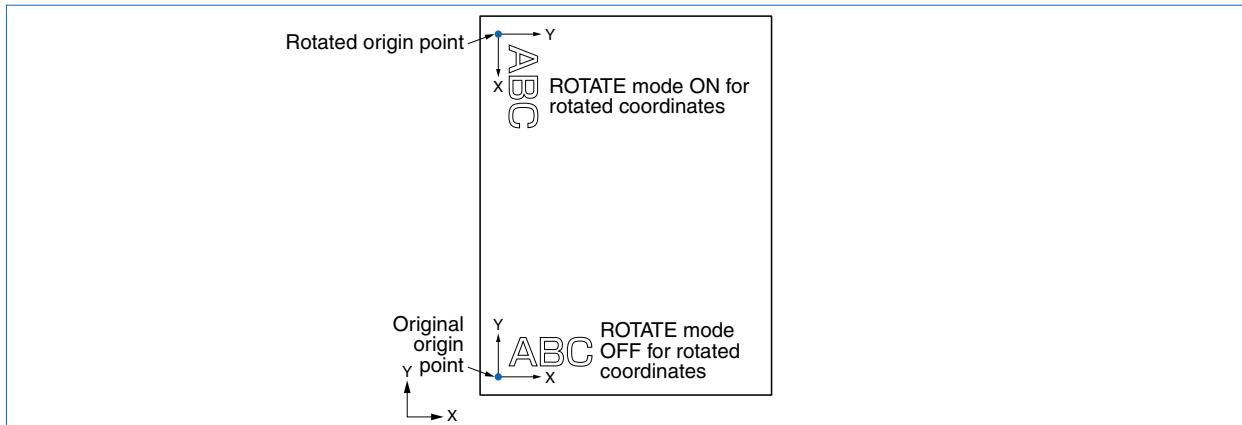
CHECKPOINT

The following message will be displayed if the lower-left and upper-right settings are set incorrectly or are not separated by at least 5 mm. In such cases, reset the lower-left and upper-right positions.

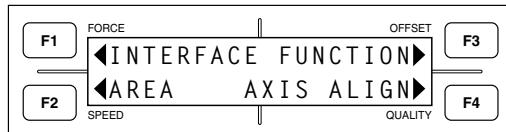


4.13 Rotating the Coordinate Axes

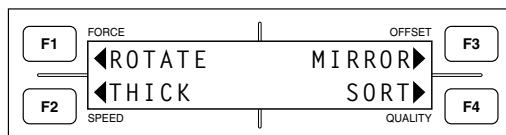
The origin point and coordinate system of an image can be rotated as shown in the example below.



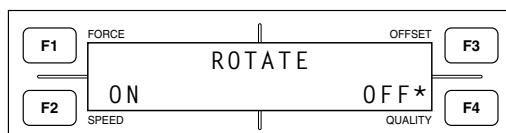
1. Press the **PAUSE** key to put the FC3600 offline.
2. Press the **NEXT PAGE** key repeatedly until the following menu is displayed.



3. Press the **F3** key (FUNCTION) to display the menu shown below.



4. Press the **F1** key (ROTATE) to display the coordinate rotation menu shown below.

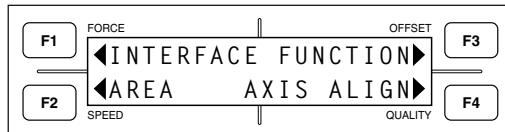


5. The current selection is indicated with an **asterisk**. To activate rotation, press the **F3** (ON) key. To deactivate it, press the **F4** (OFF) key. To cancel setup, press the **NEXT PAGE** key.
6. Press the **PAUSE** key to put the FC3600 online again.

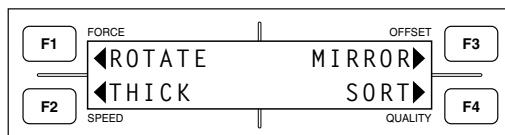
4.14 Setting THICK Mode

Take advantage of the THICK mode for cutting thick media (such as masking rubber for sandblasting or thick paper for apparel patterns) or thin yet stiff media (such as acrylic film) when using the cutter pen. THICK mode will be always activated in the condition number in which T1 or T2 is selected as the tool.

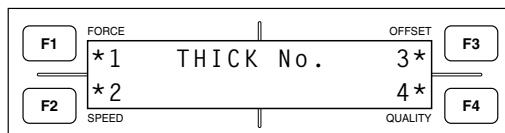
1. Press the **PAUSE** key to put the FC3600 offline.
2. Press the **NEXT PAGE** key repeatedly until the following menu is displayed.



3. Press the **F3** key (FUNCTION) to display the menu shown below.



4. Press the **F2** key (THICK) to display the THICK mode settings menu.

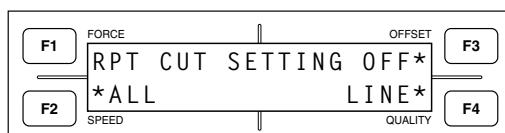


5. For the four conditions displayed, those for which THICK mode is active are marked with an **asterisk**. Press a **function key** **F1** to **F4** to mark the respective conditions with an **asterisk** and activate THICK mode. To remove an **asterisk** from a set of conditions, press the **function key** of the corresponding condition number.



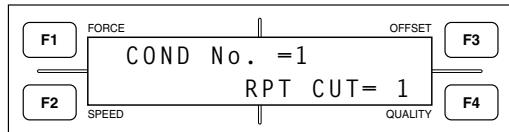
THICK mode cannot be deactivated for conditions settings set for the tangential heads (T1 or T2).

Press the **ENTER** key to confirm your choices. Next, the menu for repeat cutting settings is displayed.

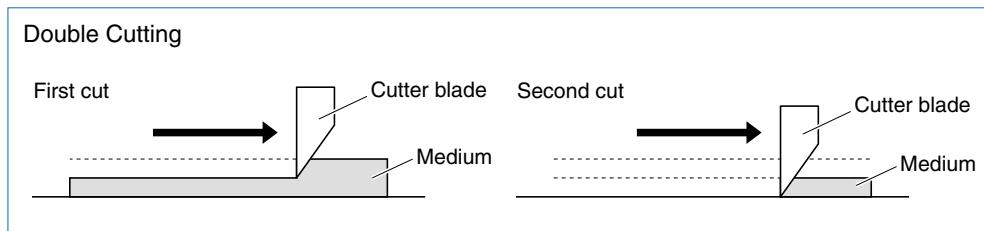


6. The current mode is marked with an **asterisk**. Refer to the list below and select the mode using the **F2** to **F4** keys.
OFF : Repeat cutting is deactivated.
ALL : Repeat cutting is performed based on all the work data, from the starting cut until the pen is automatically raised.
LINE : Repeat cutting is performed on a line-by-line basis, up to a maximum of 300 lines or until the pen is automatically raised to move to the next line segment.

After selecting the desired mode, press the  **ENTER key** to confirm your choice. If ALL or LINE has been chosen, the Repeat cutting settings menu shown below is displayed.



7. Press the  **ENTER key** once to advance through the conditions for which THICK mode is active, until reaching the desired condition to specify. Use the  or  **POSITION key** to increase or decrease the value in the range from **1** to **20 times**. After specifying the desired number of cuts, press the  **ENTER key** to confirm your choice. To cancel setup, press the  **NEXT PAGE key**. The repeat cutting mode will subdivide the distance between the top and bottom surface heights of the medium, as specified in the condition settings, into sections of equal height, depending on the number of cuts.



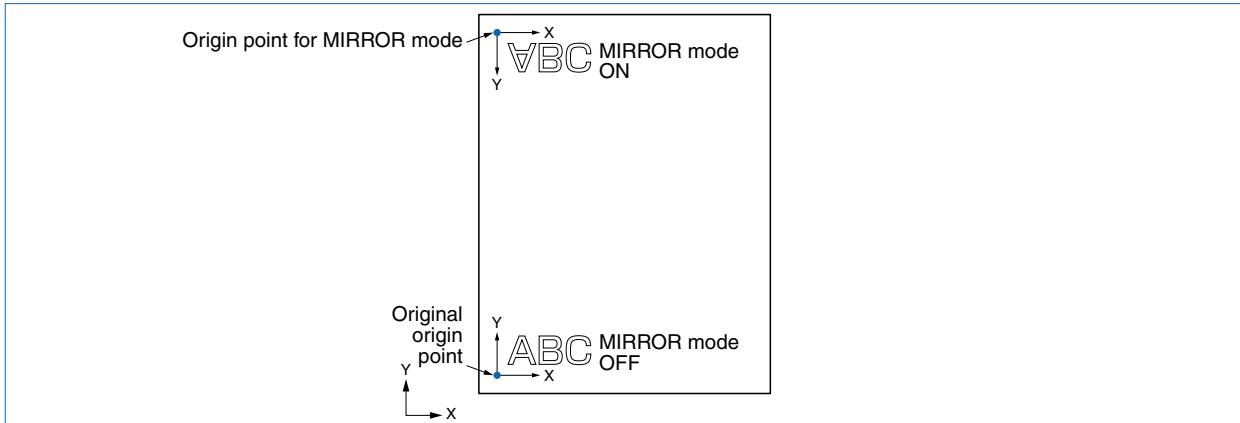
8. Press the  **PAUSE key** to put the FC3600 online again.

CHECKPOINT 

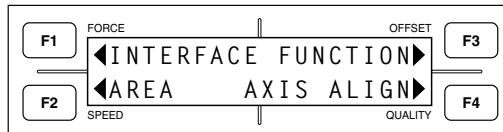
If ALL is selected, when there is no feed command at the end of the data, the FC3600 enters standby mode for a few seconds and awaits data before making the second and subsequent cuts.

4.15 MIRROR Mode

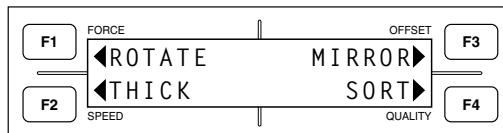
Activate MIRROR mode to reverse the origin point and coordinate system as shown in the example below.



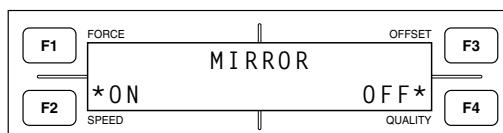
1. Press the **PAUSE** key to put the FC3600 offline.
2. Press the **NEXT PAGE** key repeatedly until the following menu is displayed.



3. Press the **F3** key (FUNCTION) to display the menu shown below.



4. Press the **F3** key (MIRROR) to display the MIRROR mode settings menu.



5. The current mode is marked with an asterisk. To activate MIRROR mode, press the **F3** (ON) key. To deactivate it, press the **F3** (OFF) key. Confirm your choice by pressing the **ENTER** key. To cancel setup, press the **NEXT PAGE** key.
6. Press the **PAUSE** key to put the FC3600 online again.



This setting is deactivated when the FC3600 is turned off.

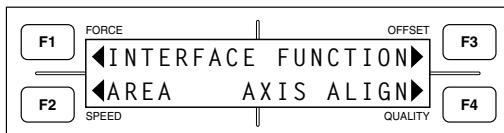


CAUTION The pen block will start moving as soon as this function is selected; Make sure to keep your hands clear of moving parts.

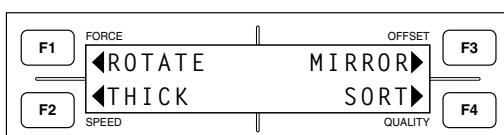
4.16 Sorting (TT or OT Type Only)

Sorting helps prevent wasted time in tool changes and increases efficiency. When sorted data from the software is received, less time is required for processing than when sorting is performed on the FC3600 itself. In such cases, switching off sorting can speed up processing.

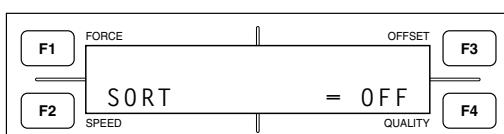
1. Press the  **PAUSE key** to put the FC3600 offline.
2. Press the  **NEXT PAGE key** repeatedly until the following menu is displayed.



3. Press the  **key (FUNCTION)** to display the menu shown below.



4. Press the  **key (SORT)** to display the Sorting settings menu.



5. The current mode is shown at right. Use the  or  **POSITION key** to cycle through **OFF**, **1**, and **2**, and to select the mode.

OFF : Sorting is deactivated.

- 1 : In the data received, all data plotted by the same tool is grouped to minimize the number of tool changes and reduce the tool-changing time.
- 2 : Additional settings are applied so that work done by cutter tools with specific conditions comes last.

After selecting the mode, confirm your choice by pressing the  **ENTER key**. To cancel setup, press the  **NEXT PAGE key**.

6. Press the  **PAUSE key** to put the FC3600 online again.

CHECKPOINT

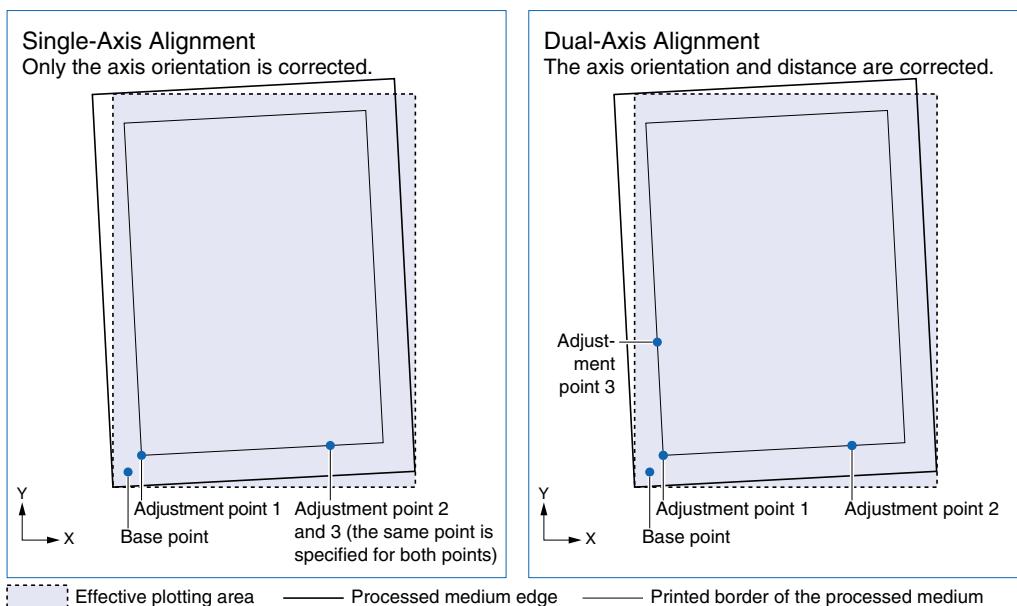
- The sorting processing is stored in the FC3600's buffer memory, so it may take a moment for cutting to begin.
- Complete the settings for COND No. 1 to 4 in advance for the cutter tools to be used in sorting. See section 3.3 "Selecting and Registering Sets of Cutting Conditions".

4.17 Aligning the Coordinate Axes

When used media is reloaded or media is loaded that has already been processed by another printer, this function can be used to compensate for any deviation in the coordinate axes and origin. Use this function to realign the coordinate axes of the FC3600 in order to match cuts in the boundary area of a pre-processed or printed medium.

■ Aligning Single Axis/Dual Axes

Alignment is based on three points of adjustment along the X- and Y-axes for adjustment of the angle of the coordinates (orientation of the X- and Y-axes), as well as the distance (length of the line segment). Adjustment points 1 and 2 are brought into alignment, as are Adjustment points 1 and 3. If the same point is specified for Adjustment points 2 and 3 (for the alignment of one axis only), only the coordinate axis is corrected. If different points are specified for Adjustment points 2 and 3 along the X- and Y-axes (for the alignment of both axes), the coordinate-axis angle and the distance are corrected.



Base point : The center point of axial eccentricity. The X- and Y-axes are slanted from this point. This is normally specified in the same position as the origin point.

Adjustment point 1 : The reference point for axial alignment. When both axes are to be corrected, it is normally positioned at the intersection of the X- and Y-axes of Adjustment points 2 and 3. (In the right-hand figure, this point corresponds to the lower-left intersection of the X- and Y-axes.)

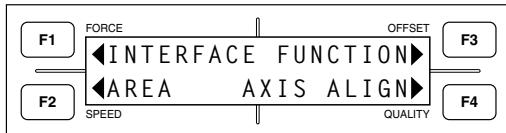
Adjustment point 2 : Positioned on the X- or Y-axis on the basis of Adjustment point 1

Adjustment point 3 : Positioned on the X- or Y-axis on the basis of Adjustment point 1. If the same point is specified for Adjustment points 2 and 3, only the angle of coordinate axis is corrected. If a point other than 2 is specified (on the other axis), the coordinate axis angle and the distance (line segment length) are corrected.

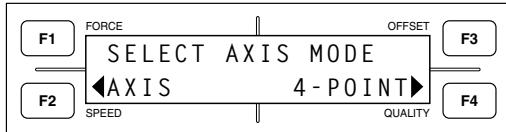
Alignment Method

1. Load the medium to be processed and secure with the vacuum pump.
2. Press the **PAUSE** key to put the FC3600 offline.

3. Press the  **NEXT PAGE key** repeatedly until the following menu is displayed.



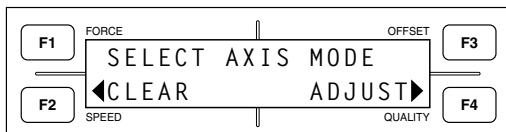
4. Press the  **key (AXIS ALIGN)** to display the menu for axis alignment selection.



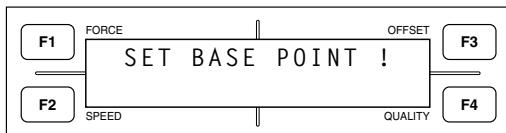
5. Press the  **key (AXIS)** to display the menu for origin point setting.



6. Use the  **POSITION keys** to move the tool blade tip (pen tip) from the current condition setting to the position of the origin point. Press the  **ORIGIN key** to set the origin point. The menu for AXIS mode selection is displayed. To cancel specification of the origin point, press the  **NEXT PAGE key** to display the mode selection menu.

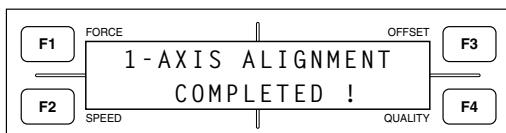


7. Press the  **key (ADJUST)** to display the Base Point settings menu.

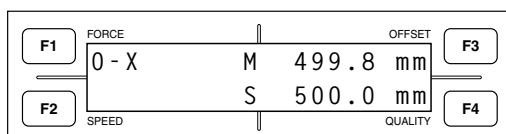


8. Use the  **POSITION keys** to move the tool blade tip (pen tip) from the current condition setting to the position of the base point and press the  **ENTER key**. If dual-axis alignment has been specified previously, the cutter blade tip will automatically move to the previous base point. Use the  **POSITION keys** to fine-tune positioning.

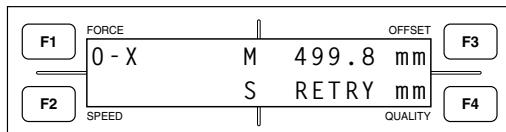
9. Next, the menus for setting Adjustment points 1, 2, and 3 will be displayed in order, so set them in the same way. If the same point is specified for Adjustment points 2 and 3, the process is complete and the menu shown below is displayed. In such cases, the distance is not corrected.



10. If different positions are specified for Adjustment points 1, 2, and 3, the menu is displayed for correction of the distance between Adjustment points 1 and 2.

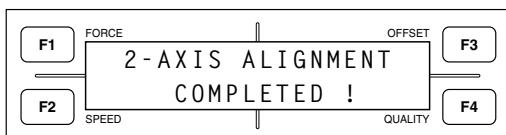


11. In M in the top row, the distance between Adjustment points 1 and 2 is displayed as measured by the plotter. In S in the bottom row, enter the actual distance (the distance according to the data). Use the **◀ or ▶ POSITION key** to move the input position between columns and the **△ or ▽ POSITION key** to increase or decrease the value. Press the **◀ ENTER key** to confirm your choice. If you attempt to enter extremely large or small values (150% greater or 50% smaller), the message shown below is displayed, prompting re-entry of the distance.

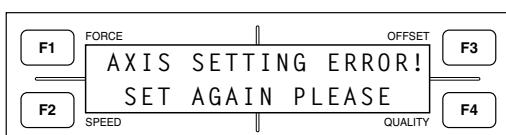


12. Next, follow the same procedure to complete the settings for the distance between Adjustment points 1 and 3.

13. When the distance between the X- and Y-axes has been successfully corrected, the message shown below is displayed for a few seconds, and the process is complete.



If there was a problem with distance alignment, the message shown below is displayed, prompting re-entry of the settings.



CHECKPOINT/

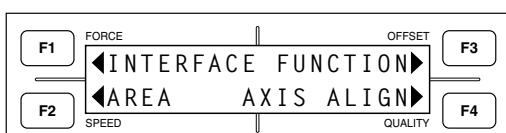
Alignment cannot be performed in the following cases:

- A distance value 150% greater than the distance before alignment is entered
- An angle 45° or greater than the axis before alignment is entered

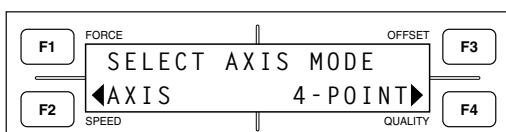
14. Press the **■ PAUSE key** to put the FC3600 online again.

Clearing Alignment Values

1. Press the **■ PAUSE key** to put the FC3600 offline.
2. Press the **NEXT PAGE key** repeatedly until the following menu is displayed.



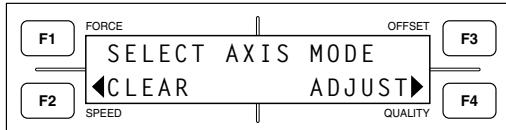
3. Press the **F4 key (AXIS ALIGN)** to display the menu for axis alignment selection.



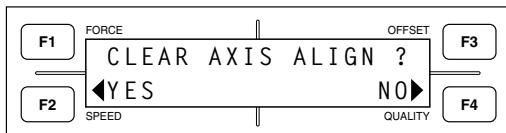
4. Press the **F2** key (**AXIS**) to display the menu for origin-point setting.



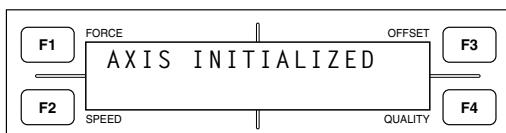
5. Press the **NEXT PAGE** key to display the mode selection menu.



6. Press the **F2** key (**CLEAR**) to display the prompt for clearing axial alignment.



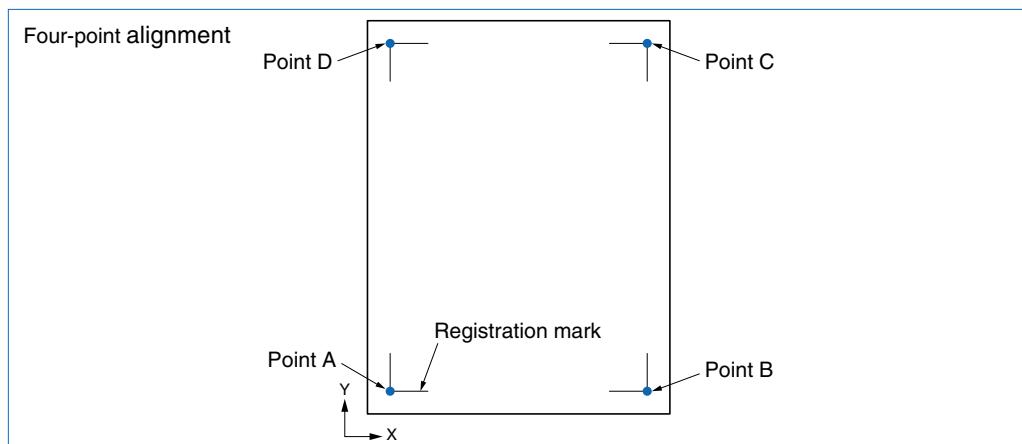
7. Press the **F2** (**YES**) key to display the message shown below, confirming that the alignment values have been restored to their default values.



8. Press the **PAUSE** key to put the FC3600 online again.

■ Four-Point Alignment

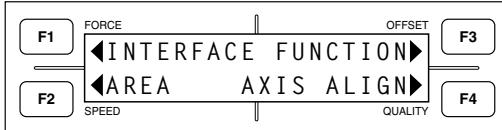
Four-point alignment is available only with the GP-GL setting. Specifying the four points A to D makes it possible to align the plotter axes with the square determined by the four points. In addition, entering the distance between points A and B, and A and D makes it possible to align the distance with the pen movements.



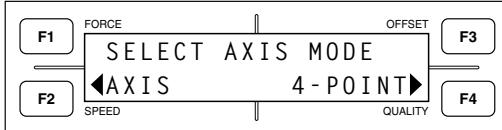
Alignment Method

1. Load the medium to be processed.
2. Press the **PAUSE** key to put the FC3600 offline.

3. Press the  **NEXT PAGE key** repeatedly until the following menu is displayed.



4. Press the  **key (AXIS ALIGN)** to display the menu for axis alignment selection.



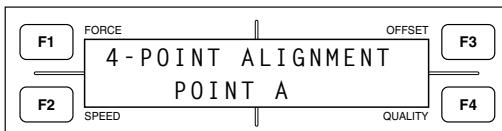
5. Press the  **key (AXIS)** to display the menu for origin point setting.



6. Use the  **POSITION keys** to move the tool blade tip (pen tip) from the current condition setting to the position of the new origin point. Press the  **ORIGIN key** to set the origin point. The menu for AXIS mode selection is displayed. To cancel specification of the origin point, press the  **NEXT PAGE key** to display the mode selection menu.



7. Press the  **key (ADJUST)** to display the menu for setting Point A.

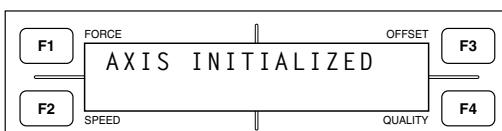


8. Use the  **POSITION keys** to move the tool blade tip (pen tip) from the current condition setting to the position for Point A and press the  **ENTER key**. If four alignment points have previously been specified, the cutter blade tip will automatically move to the previous Point A. Use the  **POSITION keys** to fine-tune positioning.

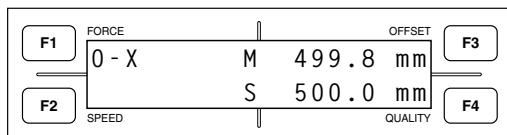
9. Next, the menus for setting Points B, C, and D will be displayed in order; set them in the same way. If you attempt to enter points for extreme alignment, the message shown below is displayed, prompting re-entry from Point A.



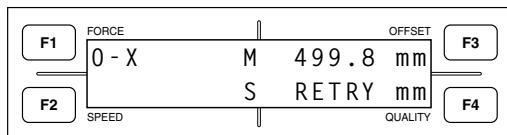
If the four points are at the same position, axial alignment will be cleared.



10. If different positions are specified for Points A, B, C, and D, the menu is displayed for correction of the distance between Points A and D.



11. In M in the top row, the distance between Points A and D is displayed as measured by the plotter. In S in the bottom row, enter the actual distance (the distance according to the data). Use the \triangleleft or \triangleright POSITION key to move the input position between columns and the \triangle or ∇ POSITION key to increase or decrease the value. Press the \blacksquare ENTER key to confirm your choice. If you attempt to enter extremely large or small values (150% greater or 50% smaller), the message shown below is displayed, prompting re-entry of the distance.

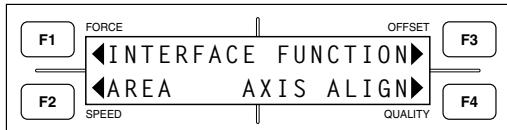


12. Next, follow the same procedure to complete the settings for the distance between Points A and B.

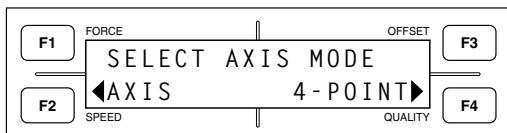
13. Press the \blacksquare PAUSE key to put the FC3600 online again.

Clearing the Alignment Values

1. Press the \blacksquare PAUSE key to put the FC3600 offline.
2. Press the \blacksquare NEXT PAGE key repeatedly until the following menu is displayed.



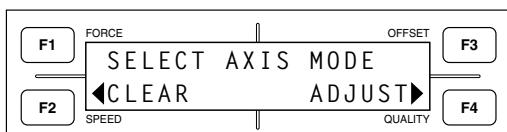
3. Press the \blacksquare key (AXIS ALIGN) to display the menu for axis alignment selection.



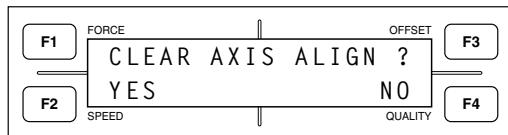
4. Press the \blacksquare key (AXIS) to display the menu for origin point setting.



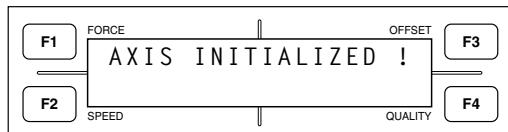
5. Press the \blacksquare NEXT PAGE key to display the mode selection menu.



6. Press the **F2** key (**CLEAR**) to display the prompt for clearing axial alignment.



7. Press the **F2** (YES) key to display the message shown below, confirming that the alignment values have been restored to their default values.



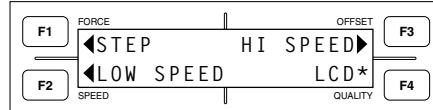
8. Press the **PAUSE** key to put the FC3600 online again.

4.18 Specifying the Speed of the Tool Head

This setting determines how far and how fast the tool head moves when the **◀▶△▽ POSITION keys** are used. When one of the **◀▶△▽ POSITION keys** is pressed initially, the tool head moves only the specified distance. If the key is held down, the tool head moves more quickly after moving the specified length (distance).

CHECKPOINT

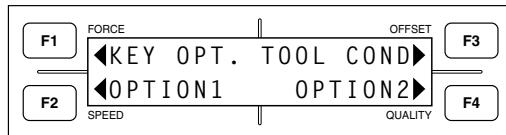
When the LCD in the menu shown below is marked with an asterisk, the coordinates are displayed during movement when the **◀▶△▽ POSITION keys** are used. Press the **F4** key to activate or deactivate this function.



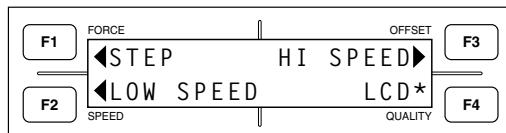
■ Specifying the Step Distance

This setting determines the distance the tool head moves each time one of the **◀▶△▽ POSITION keys** is pressed. The setting distance is an approximate measure of the distance actually moved. (Default value: 25 mm)

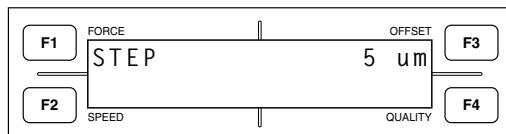
1. Press the **PAUSE** key to put the FC3600 offline.
2. Press the **NEXT PAGE** key repeatedly until the following menu is displayed.



3. Press the **F1** key (KEY OPT.) to display the menu shown below.



4. Press the **F1** key (STEP) to display the step movement settings menu.



5. Use the **△** or **▽** POSITION key to cycle the value through **5, 10, 25, 50, and 100 µm** and press the **ENTER** key to select the desired value. To cancel setup, press the **NEXT PAGE** key.
6. Press the **PAUSE** key to put the FC3600 online again.

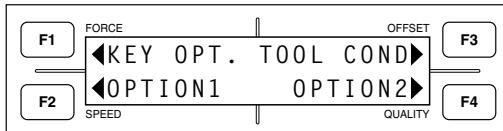
■ Specifying the Low Speed Setting

This setting determines the slower speed when one of the **◀▶△▽ POSITION keys** is initially pressed, and the distance (length) before faster movement begins.

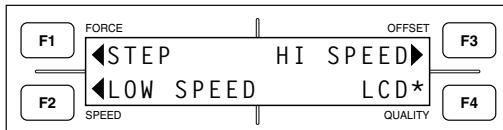
(Default values: LOW-SPEED: 2 cm/s; LENG: 2 cm)

1. Press the **PAUSE** key to put the FC3600 offline.

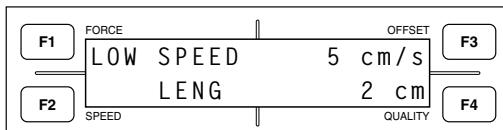
2. Press the  **NEXT PAGE key** repeatedly until the following menu is displayed.



3. Press the  **F1 key (KEY OPT.)** to display the menu shown below.



4. Press the  **F2 key (LOW SPEED)** to display the low-speed settings menu.



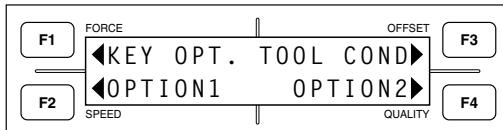
5. Press the  **F3 key (LOW SPEED)** to specify the low speed of the tool head. Press the  **F4 key (LENG)** to specify the length (distance) moved before high-speed movement begins. Use the  or  **POSITION key** to increase or decrease the values and press the  **ENTER key** to confirm your choices. To cancel setup, press the  **NEXT PAGE key**.

6. Press the  **PAUSE key** to put the FC3600 online again.

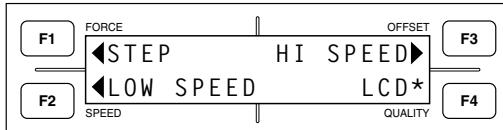
■ Specifying the High Speed Setting

This setting determines the high speed settings when one of the     **POSITION keys** is held down. (Default value: 20 cm/s)

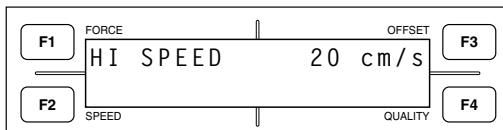
1. Press the  **PAUSE key** to put the FC3600 offline.
2. Press the  **NEXT PAGE key** repeatedly until the following menu is displayed.



3. Press the  **F1 key (KEY OPT.)** to display the menu shown below.



4. Press the  **F2 key (HI SPEED)** to display the high-speed settings menu.



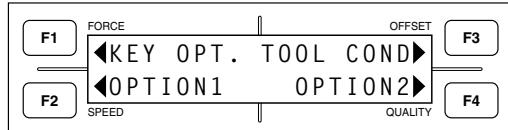
5. Use the  or  **POSITION key** to increase or decrease the values and press the  **ENTER key** to confirm your choice. To cancel setup, press the  **NEXT PAGE key**.
6. Press the  **PAUSE key** to put the FC3600 online again.

4.19 Specifying the Tool-Up Speed

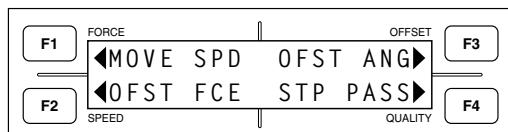
This setting determines the speed at which the tool head is raised. A faster tool-up speed shortens the overall cutting time.

(Default value: 20)

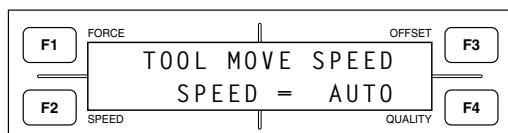
1. Press the **PAUSE** key to put the FC3600 offline.
2. Press the **NEXT PAGE** key repeatedly until the following menu is displayed.



3. Press the **OPTION1** key (F2) to display the menu shown below.



4. Press the **MOVE SPD** key (F1) to display the tool-up speed settings menu.



5. Use the **△** or **▽** POSITION key to cycle the value through **AUTO**, **10**, **20**, **30**, and **60** and press the **ENTER** key to select the desired value.

AUTO : The tool-up speed matches the tool-down speed.

To cancel setup, press the **NEXT PAGE** key.

6. Press the **PAUSE** key to put the FC3600 online again.

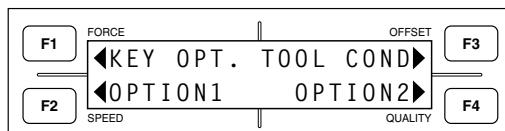
4.20 Specifying the Offset Force (When the Cutter Pen is Used)

This setting determines the cutting force applied when cutting thick media to control the rotation of the blade tip during initial blade control. Use higher setting values for a stronger cutting force.
(Default value: 4)

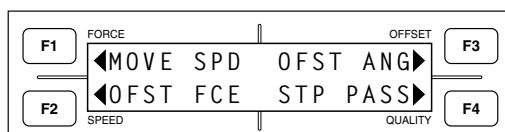


This setting is valid only for the cutter pen used with the pen block.

1. Press the **PAUSE** key to put the FC3600 offline.
2. Press the **NEXT PAGE** key repeatedly until the following menu is displayed.



3. Press the **F2** key (OPTION1) to display the menu shown below.



4. Press the **F2** key (OFST FCE) to display the offset force settings menu.



5. Use the **△** or **▽** POSITION key to increase or decrease the value in the range from **1** to **40** and press the **ENTER** key to select the desired value. To cancel setup, press the **NEXT PAGE** key.
6. Press the **PAUSE** key to put the FC3600 online again.

4.21 Specifying the Offset Angle

The FC3600 controls the angle of the cutter blade tip based on changes in the angles in the task data. This setting specifies the reference angle that determines whether angle control is applied. Specifying a high reference angle will shorten overall cutting time by reducing the time required for blade control, since the FC3600 will control the blade only for large variations in the angle. However, setting an extreme offset angle may produce cutting results that fail to reproduce the intended image.

Offset Angle 1 : Specifies the reference angle for raising the tool during rotation when cutting corners in THICK mode

CAUTION Large values may lead to blade damage in some cases when using the tangential head.

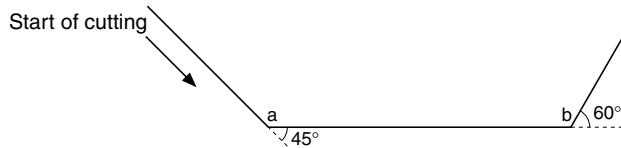
Offset Angle 2 : Specifies the reference angle at which the tool remains lowered during rotation when cutting corners in THICK mode. Also specifies the length (distance) at which blade rotation ends when the blade is rotated during cutting.

CHECKPOINT The setting for Offset Angle 2 is active when T1 or T2 is selected as the tool.

■ Offset Angle-1 Setting

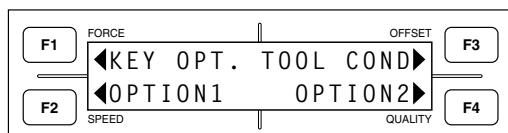
Specifies the reference angle for raising the tool during rotation. The tool blade is raised during cutting when the angle of the corner defined by the data is larger than the specified value.

(Default value: 20°)

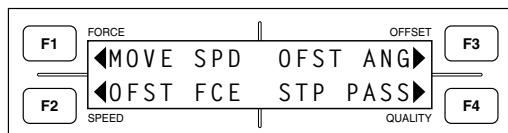


- When Offset Angle 1 is set to 30: At angles a and b, the tool is raised and the blade tip orientation adjusted before work resumes.
- When Offset Angle 1 is set to 50: Only at angle b is the tool raised and the blade tip orientation adjusted before work resumes.

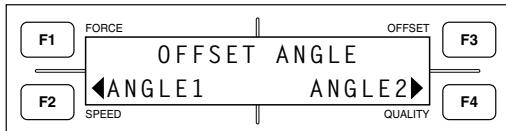
1. Press the **PAUSE** key to put the FC3600 offline.
2. Press the **NEXT PAGE** key repeatedly until the following menu is displayed.



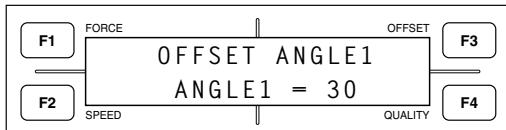
3. Press the **OPTION1** key to display the menu shown below.



4. Press the **F3** key (**OFST ANG**) to display the offset angle settings menu.



5. Press the **F2** key (**ANGLE1**) to display the settings menu for Offset Angle 1.



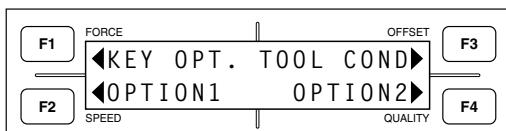
6. Use the Δ or ∇ **POSITION key** to increase or decrease the value in the range from 1° to 60° until the desired value is reached. Press the **ENTER key** to confirm your choice. To cancel setup, press the **NEXT PAGE key**.
7. Press the **PAUSE key** to put the FC3600 online again.

■ Offset Angle-2 Setting

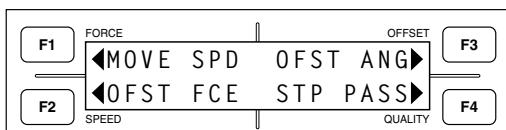
Specifies the reference angle for corners at which the tool remains lowered during rotation. Also specifies the length (distance) when the blade is rotated during cutting at which blade rotation ends. When the tool is down, if the sum of the rotational angles exceeds the setting of Offset Angle 1, the tool is raised and the blade tip is rotated before work is resumed.

(Default values: ANGLE 2: 10° ; L1: 0 mm; L2: 4 mm)

1. Press the **PAUSE key** to put the FC3600 offline.
2. Press the **NEXT PAGE key** repeatedly until the following menu is displayed.



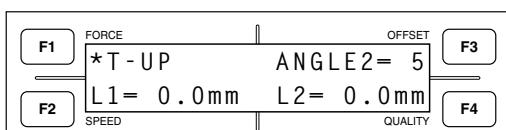
3. Press the **F2** key (**OPTION1**) to display the menu shown below.



4. Press the **F3** key (**OFST ANG**) to display the Offset Angle settings menu.



5. Press the **F4** key (**ANGLE2**) to display the settings menu for Offset Angle 2.



6. Press the **F1** key to place an **asterisk** to the left of T-UP and activate it so that when the tool is down, if the sum of the rotational angles exceeds the setting of Offset Angle 1, the tool is raised and the blade tip is rotated before work is resumed. Press the **F3** key to move the cursor to the ANGLE2 area and specify the length until the end of rotation. Press the **F3** key and **F4** key to move the cursor to the L1 and L2 areas, respectively. Use the \triangle or ∇ **POSITION** key to increase or decrease the value until the desired value is reached. Press the **ENTER** key to confirm your choices. To cancel setup, press the **NEXT PAGE** key.

ANGLE 2: If the angle corresponding to the corner exceeds the specified value, at the start of the cutting of the line segment, the tool remains down while the blade tip is rotated.

Setting range: **0° to 60°**

L1 : If the line segment after the corner is shorter than the specified value, at the start of the cutting of the line segment, the tool remains down while the blade tip is rotated.

Setting range: **0 to 9.9 mm**

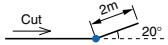
L2 : When cutting continues while the blade tip is rotated, rotation is ended after the corner when the specified length (distance) is reached. If the line segment is shorter than the specified length, rotation is ended within the range of the line segment length.

Setting range: **0 to 9.9 mm**

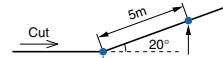
Examples for when ANGLE 1 (Offset Angle 1) = 40°, ANGLE 2 = 30°, L1 = 3 mm, and L2 = 5 mm



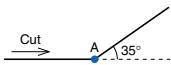
The angle is less than ANGLE 2, so the blade will be rotated from A during cutting.



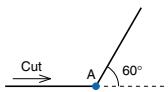
The angle is less than ANGLE 2 and the line segment after the corner is less than L1, so the blade will be rotated at A, and continue cutting.



Start rotation
End rotation
The angle is less than ANGLE 2 and the blade rotation will be ended within the length of L2 on the line-segment after the corner (A).



The angle is greater than ANGLE 2, so the blade will be rotated at A, and continue cutting.



The angle is greater than ANGLE 1, so the tool will be raised at A to rotate the blade.



Specify a greater value for L2 than for L1.

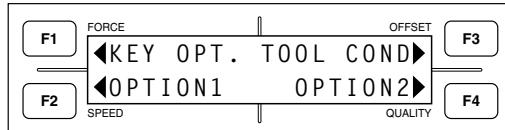
7. Press the **PAUSE** key to put the FC3600 online again.

4.22 Specifying the Step Path

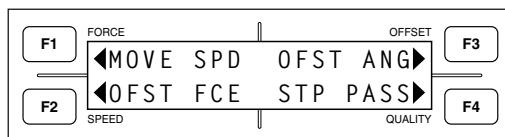
To improve the work quality for arcs and other detailed shapes, specify a small value for more precise blade tip control. The specified step pass value will be used as the basic unit for blade tip control. As data under this value is disregarded, if the setting is too high, the image defined by the data may not be faithfully reproduced in some cases.

(Default value: 1)

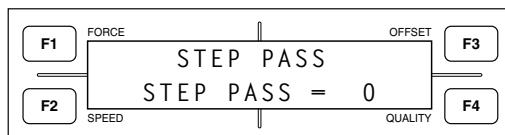
1. Press the **PAUSE** key to put the FC3600 offline.
2. Press the **NEXT PAGE** key repeatedly until the following menu is displayed.



3. Press the **F2** key (OPTION1) to display the menu shown below.



4. Press the **F4** key (STP PASS) to display the Step Pass settings menu.



5. Use the Δ or ∇ POSITION key to increase or decrease the value in the range from **0** to **800** for HP-GL or **0** to **200** for GP-GL* until the desired value is reached. Press the **ENTER** key to confirm your choice. To cancel setup, press the **NEXT PAGE** key.

* At a step size of 0.100 mm. (For details on step size, see section 4.11 "Specifying the Data Format to be Received".)

6. Press the **PAUSE** key to put the FC3600 online again.

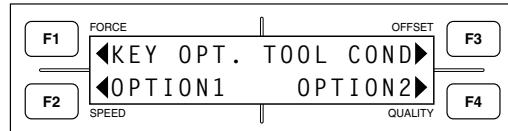
4.23 Selecting the Tangential Head or Pen Block

This setting determines the selection of the tangential head or pen block to be used in conditions 1 to 4.

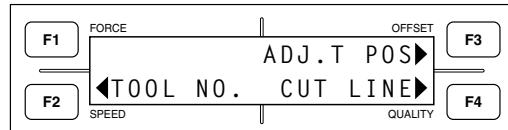


Different setting items apply when the tangential head and pen block are used, so complete these settings before specifying conditions.

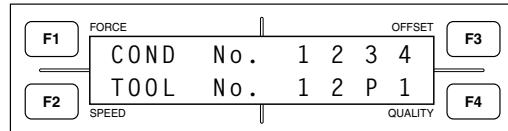
1. Press the **PAUSE** key to put the FC3600 offline.
2. Press the **NEXT PAGE** key repeatedly until the following menu is displayed.



3. Press the **F3** key (TOOL COND) to display the menu shown below.



4. Press the **F2** key (TOOL NO.) to display the tool selection menu.



5. The COND No. options (1 to 4) represent the condition numbers. Use the **POSITION** key to move the cursor and select the condition number. Then select the desired tool, using the **POSITION** key to display tool numbers (see below) in sequence.

P : Pen block

1 : Tangential head 1 (T1)

2 : Tangential head 2 (T2) (TT or OT type only)

After selecting the desired tool, press the **ENTER** key to confirm your choice. To cancel setup, press the **NEXT PAGE** key.

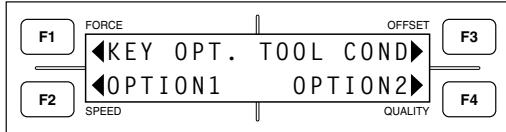
6. Press the **PAUSE** key to put the FC3600 online again.

4.24 Adjusting the Tool Distance

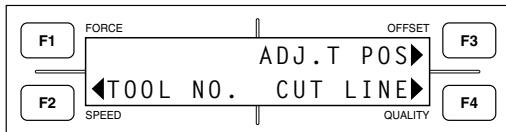
■ Distance Adjustment for the Tangential Heads and Pen Block

This setting adjusts the distance between tangential head 1 and the pen block or between tangential heads 1 and 2.

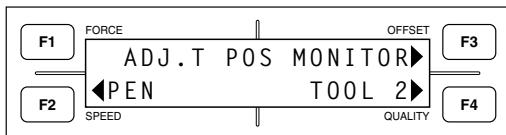
1. Mount the cutting tool on the tangential head and pen block for adjustment.
2. Load the medium for test pattern cutting and secure with the vacuum pump.
3. Press the  **PAUSE key** to put the FC3600 offline.
4. Press the  **NEXT PAGE key** repeatedly until the following menu is displayed.



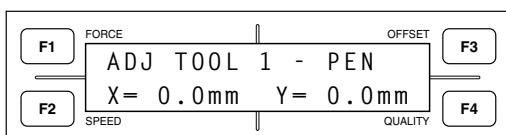
5. Press the  **F3 key (TOOL COND)** to display the menu shown below.



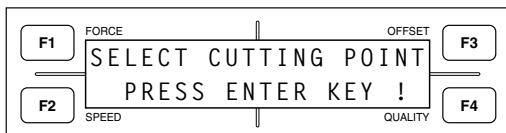
6. Press the  **F3 key (ADJ. T POS)** to display the settings menu for tool distance adjustment.



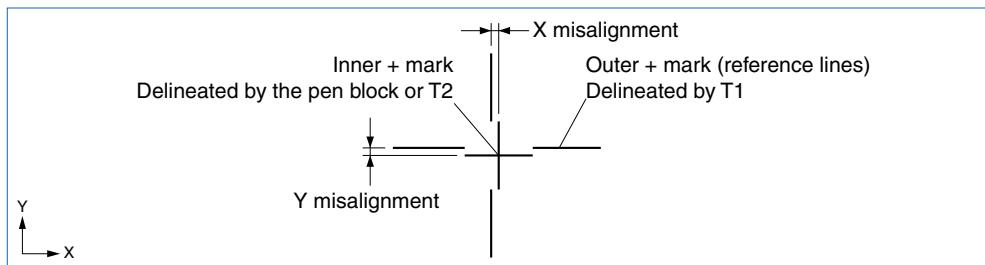
7. Press the  **F2 key (PEN)** to display the adjustment value for the distance between tangential head 1 and the pen block. Press the  **F4 key (TOOL 2)** to display the adjustment value for the distance between tangential heads 1 and 2.



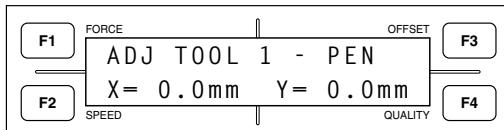
8. Press the  **TEST key** to display the message shown below.



9. Use the **◀▶△▽ POSITION keys** to move the tool blade tip to the position on the medium where the test pattern will be cut and press the **ENTER key**. After cutting the test pattern, measure the distance of misalignment (the adjustment value) between X and Y.



10. Upon completion of the task, the menu for distance adjustment is displayed.



11. Use the **F2** and **F4** keys to move the cursor to the X and Y areas, respectively. Use the **△** or **▽ POSITION key** to increase or decrease the adjustment values, then press the **ENTER key** to confirm your choices. To cancel adjustment, press the **NEXT PAGE key**.

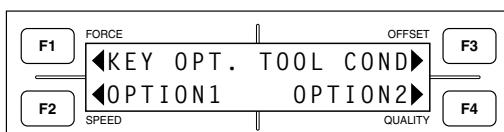
12. Conduct another test cutting and repeat the adjustment process until the + symbol is aligned.

13. Press the **PAUSE key** to put the FC3600 online again.

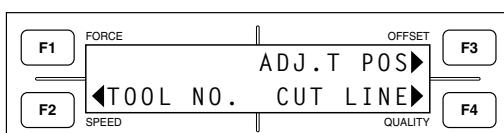
■ Distance Adjustment for Tangential Head 1 and the CCD Camera (Optional)

This setting adjusts the distance between tangential head 1 and the optional CCD camera.

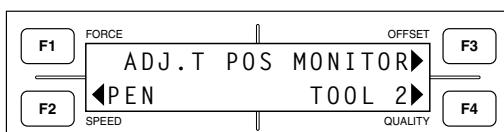
1. Mount the cutting tool on tangential head 1.
2. Load the medium for test pattern cutting and secure with the vacuum pump.
3. Press the **PAUSE key** to put the FC3600 offline.
4. Press the **NEXT PAGE key** repeatedly until the following menu is displayed.



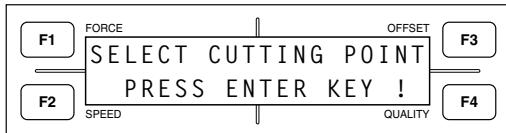
5. Press the **F3** key (TOOL COND) to display the menu shown below.



6. Press the **F3** key (ADJ. T POS) to display the settings menu for tool distance adjustment.

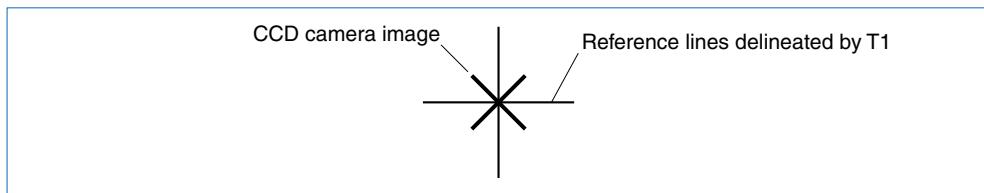


7. Press the **F3** key (MONITOR) to display the menu shown below.



8. Use the **◀▶△▽ POSITION keys** to move the tool blade tip to the position on the medium where the test pattern will be cut.

9. Press the **↙ ENTER key** to delineate the test pattern. Press the **◀▶△▽ POSITION keys** to adjust the CCD camera position.



CHECKPOINT

The mark indicating CCD camera alignment can be changed. See section 6.1 "Description of the Special Functions" for different marks, and instructions for changing the mark.

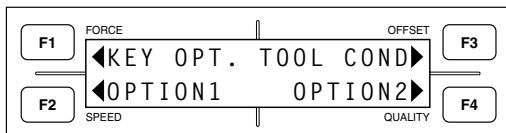
10. Press the **↙ ENTER key** to confirm your choice. To cancel adjustment, press the **NEXT PAGE key**.

11. Press the **PAUSE key** to put the FC3600 online again.

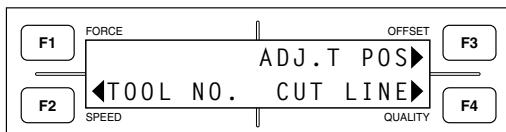
4.25 Setting Perforations

This setting determines perforation cutting operations under conditions 1 to 4.

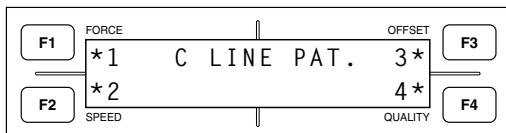
1. Press the **PAUSE** key to put the FC3600 offline.
2. Press the **NEXT PAGE** key repeatedly until the following menu is displayed.



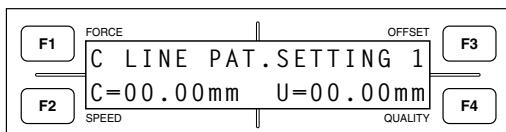
3. Press the **F3** key (TOOL COND) to display the menu shown below.



4. Press the **F4** key (CUT LINE) to display the Perforation settings menu.



5. The numbers 1 to 4 represent condition numbers. Those with perforation setting specified are marked with an **asterisk**. Press a **function key** from **F1** to **F4** to place or remove an **asterisk** to turn the feature on and off for each condition number. Press the **ENTER** key upon completing the settings.



6. Press the **NEXT PAGE** key to cycle through the conditions under which perforation is active. Select a COND No., then press the **F2** key or **F4** key to move the cursor to the C or U area, respectively. Use the **△** or **▽** **POSITION** key to increase or decrease the value. After selecting the desired value, press the **ENTER** key to confirm your choice.

C : Cut length (the length of time for which the pen is down)

U : Uncut length (the length of time for which the pen is up)

To cancel setup, press the **NEXT PAGE** key.

CHECKPOINT

When a value of "0" is entered for U (the uncut length), work proceeds with a pause for each C (cut length) segment. Use this setting to perform difficult cutting of soft media such as sponges. In this case, the pause time is the same as the Tool-down Standby setting. For details see page 4-3 "Tool-Down Standby Time".

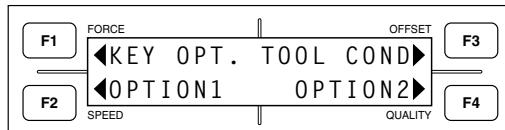
7. Press the **PAUSE** key to put the FC3600 online again.

4.26 Specifying the Initial Cutting Force (When Using the Cutter Pen)

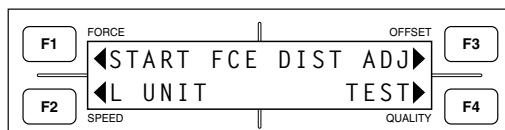
In some cases in which thick media is cut, cut marks are left on the medium at the start point when cutting is started before the cutter blade reaches the bottom of the medium, even if the required cutting force is applied. After blade tip control has started (at the start of cutting or cutter blade rotation), additional initial cutting force can prevent cut marks by ensuring that the cutter blade reaches the bottom of the medium. Specify higher values for greater cutting force. Note that the initial cutting force is a supplemental cutting force added momentarily to the cutting force specified in the conditions.

(Default value: 4)

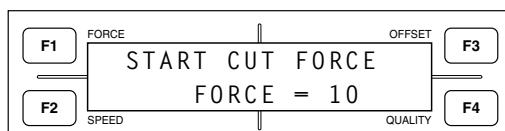
1. Press the **PAUSE** key to put the FC3600 offline.
2. Press the **NEXT PAGE** key repeatedly until the following menu is displayed.



3. Press the **F4** key (OPTION2) to display the menu shown below.



4. Press the **F1** key (START FCE) to display the settings menu for initial cutting force.

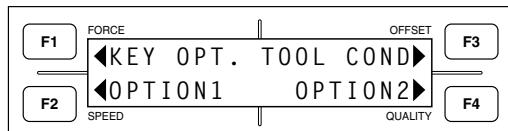


5. Use the **△** or **▽** POSITION key to increase or decrease the value in the range from 1 to 20. Press the **ENTER** key upon completing the settings. To cancel setup, press the **NEXT PAGE** key.
6. Press the **PAUSE** key to put the FC3600 online again.

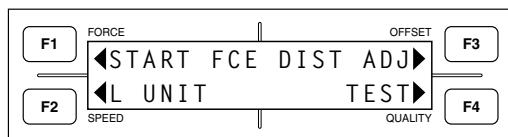
4.27 Specifying the Unit of Length

The display can show coordinate values in units of millimeters or inches.
(Default value: mm)

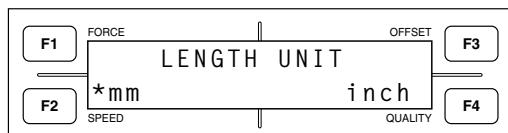
1. Press the **PAUSE** key to put the FC3600 offline.
2. Press the **NEXT PAGE** key repeatedly until the following menu is displayed.



3. Press the **F4** key (OPTION2) to display the menu shown below.



4. Press the **F2** key (L UNIT) to display the Length Unit settings menu.

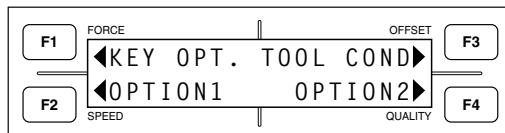


5. The current selection is indicated with an **asterisk**. Press the **F2** key or **F4** key to place an **asterisk** next to mm (millimeters) or inch, respectively. After specifying the unit, press the **ENTER** key to confirm your choice. To cancel setup, press the **NEXT PAGE** key.
6. Press the **PAUSE** key to put the FC3600 online again.

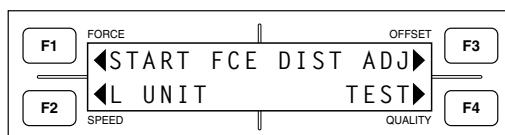
4.28 Setting the Distance Adjust Values (Line Segment Length)

This function is used to correct line length deviation that may occur due to the media used. For adjustment, the amount of deviation is expressed as a percentage. For example, a setting of 0.10% adjusts a distance of 1 m (1000 mm) by +1 mm (1000 x 0.10% = 1 mm), for a result of 1,001 mm.

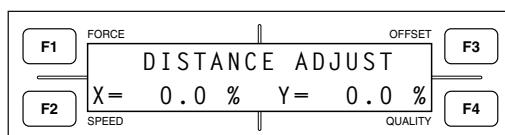
1. Press the **PAUSE** key to put the FC3600 offline.
2. Press the **NEXT PAGE** key repeatedly until the following menu is displayed.



3. Press the **F4** key (OPTION2) to display the menu shown below.



4. Press the **F3** key (DIST ADJ) to display the settings menu for distance adjustment.



5. Use the **F2** and **F4** keys to move the cursor to the X and Y areas, respectively. Use the **POSITION** key to increase or decrease the values in the range from **-0.25%** to **+0.25%**, in 0.05% increments. After specifying adjustment values, press the **ENTER** key to confirm your choices. To cancel adjustment, press the **NEXT PAGE** key.
6. Press the **PAUSE** key to put the FC3600 online again.

CHECKPOINT

If positive adjustment values are specified, the size of the maximum work area will be reduced.

For example: Specifying X = + 0.10% and Y = 0.10% results in a work area of x = 999 mm and y = 1218 mm.

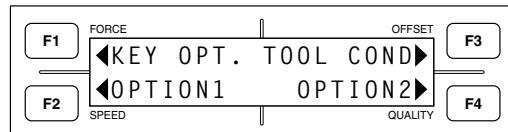
4.29 Test Modes

The FC3600 offers three types of TEST modes: PRINT CONDITIONS (for printing condition details), SELF TEST (for checking precision), and CHAR DUMP (for checking data sent from computers). Use the modes to confirm various settings and perform troubleshooting.

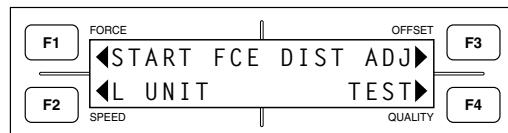
■ PRINT CONDITIONS Mode

To print a list of the details of the current condition:

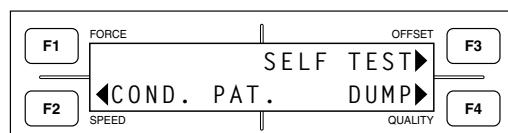
1. Load paper for printing the conditions and secure with the vacuum pump.
2. Mount a plotter pen into the pen block and specify the settings for use of the plotter pen.
3. Press the **PAUSE** key to put the FC3600 offline.
4. Press the **NEXT PAGE** key repeatedly until the following menu is displayed.



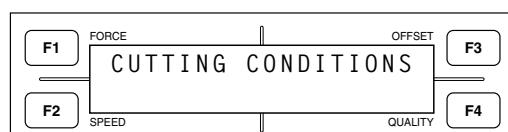
5. Press the **F4** key (OPTION2) to display the menu shown below.



6. Press the **F4** key (TEST) to display the TEST mode settings menu.



7. When the **F2** key (COND. PAT.) is pressed, the display will indicate "CUTTING CONDITIONS" and will start printing a list of the cutting conditions.



8. The FC3600 will return to READY status upon completion of printing.

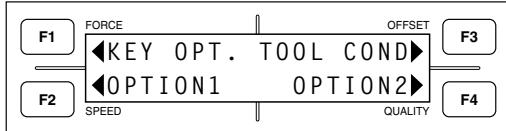
CAUTION The pen block will start moving as soon as this function is selected. Keep your hands and head clear of moving parts.

■ SELF TEST Mode

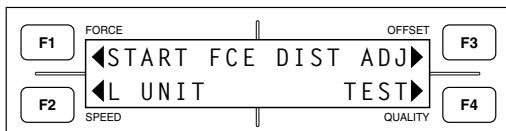
To print a self test pattern for checking precision:

1. Load paper for printing the self test pattern and secure with the vacuum pump.
2. Mount a plotter pen into the pen block and specify the settings for using the plotter pen.

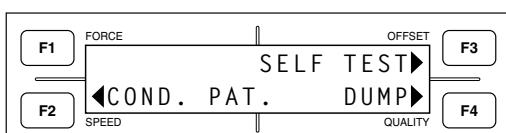
3. Press the **PAUSE** key to put the FC3600 offline.
4. Press the **NEXT PAGE** key repeatedly until the following menu is displayed.



5. Press the **F4** key (OPTION2) to display the menu shown below.



6. Press the **F4** key (TEST) to display the TEST mode settings menu.



7. When the **F3** key (SELF TEST) is pressed, the display will indicate self test printing to start printing the self test pattern.



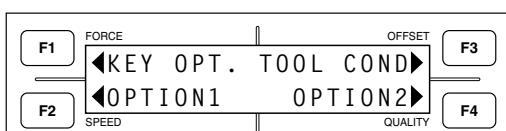
8. To stop printing the self test pattern, turn off the FC3600.

CAUTION The pen block will start moving as soon as this function is selected. Keep your hands and head clear of moving parts.

■ CHARACTER DUMP Mode

For confirming that computer data is sent correctly. After producing the dump list, check the transfer and connection conditions if the data list does not match the program.

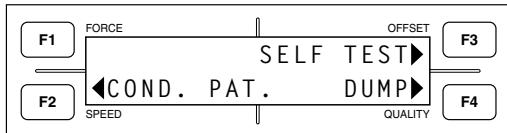
1. Load paper to print the dump list and secure with the vacuum pump.
2. Mount a plotter pen into the pen block and specify the settings for the plotter pen.
3. Press the **PAUSE** key to put the FC3600 offline.
4. Press the **NEXT PAGE** key repeatedly until the following menu is displayed.



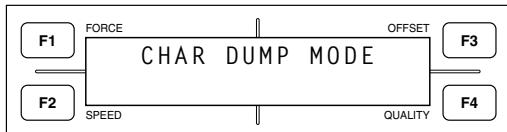
5. Press the **F4** key (OPTION2) to display the menu shown below.



6. Press the **F4** key (**TEST**) to display the TEST mode settings menu.



7. When the **F4** key (**DUMP**) is pressed, the display will indicate DUMP mode.



8. In this state, send data to the FC3600 to start dump list printing.

9. To stop printing the dump list, turn off the FC3600.

CHECKPOINT

The dump list is printed as ASCII code. Non-coded characters are printed as small two-digit numbers. In response to the receipt of a READ-type command, the FC3600 returns dummy data except when requested to output its current status.

CAUTION The pen block will start moving as soon as this function is selected. Keep your hands and head clear of moving parts.

5

CUTTING PROCEDURES

5.1	Cutting with XB57 or BSB-13P Tool Holder Cutter Blades.....	5-2
5.2	Cutting with the XB157T Tool Holder Cutter Blade	5-6
5.3	Cutting with the CB30U-OS20 Oscillation Cutter Blade, Part 1	5-10
5.4	Cutting with the CB30U-OS20 Oscillation Cutter Blade, Part 2.....	5-15
5.5	Cutting with the CB30U-OS40 Oscillation Cutter Blade, Part 1	5-21
5.6	Cutting with the CB30U-OS40 Oscillation Cutter Blade, Part 2	5-26

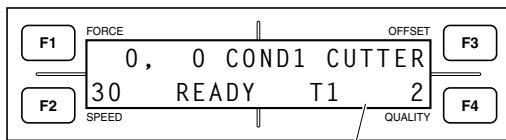
5.1 Cutting with XB57 or BSB-13P Tool Holder Cutter Blades

The guidelines for media that can be cut using the XB57 are as follows: cardboard (1.5 mm and under), plastic sheets (1 mm and under), corrugated cardboard (E-flute and under), and rubber (1.5 mm and under).

The guidelines for media that can be cut using the BSB-13P are as follows: cardboard (1.5 mm and under), leather (2 mm and under), corrugated cardboard (E-flute and under), and rubber (2.5 mm and under).

* Figures in parentheses indicate media thickness.

1. After confirming that the FC3600 has been turned off, remove the protective cover.
(See section 2.10 "Mounting the Protective Cover".)
2. Adjust the pen block height to suit the thickness of the media to be cut.
(See section 2.8 "Adjusting the Pen Block Height for Medium Thickness".)
3. If applicable, mount the optional material hold-down attachment.
(See section 2.9 "Mounting the Optional Material Hold-Down Attachment".)
4. Attach the protective cover.
(See section 2.10 "Mounting the Protective Cover".)
5. For the O or OT type, make the following settings:
 - **Switch the spring pressure.** (See section 2.5 "Mounting the Tool Holder".)
Lower the spring pressure adjuster on the tangential head 1 to the bottom position.
 - **Prepare the tool block.** (See section 6.2 "Settings for Special Functions.)
Press and hold the  POSITION key while turning the FC3600 on to display the special functions menu. Press the  NEXT PAGE key to display the TOOL BLOCK SETTING menu, then select CUTTER. Complete the settings and then turn off the power. When CUTTER is selected, O will not be shown on the READY status display.



Blank when the CUTTER is selected

6. Assemble the blade holder and tool holder.
(See section 2.4 "Mounting Cutter Blades".)

 **CAUTION**

- To avoid accidentally cutting yourself with the sharp blade, be particularly careful when handling the blade during assembly.
- Firmly tighten the screw. Loose screws may cause accidents.

7. Mount the tool holder on the tangential head.
(See section 2.5 "Mounting the Tool Holder".)

 **CAUTION**

- Insert the tool holder fully into the tangential head, and tighten the stopper screws. Loose screws may cause accidents.
- Tighten the stopper screws on the tangential heads even if nothing is mounted. If the screws come loose during operations accidents may result.

8. Select the tool head assigned to the COND No.

(See section 3.4 “Selecting the Tangential Head or Pen Block”.)

After turning on the power, press the following keys sequentially to display the tool selection menu:

 **NEXT PAGE** → **F3 (TOOL COND)** → **F2 (TOOL NO.)**.

F1	FORCE	COND	No.	1	2	3	4	F3
F2	SPEED	TOOL	No.	1	2	P	1	F4
OFFSET								
QUALITY								

In the COND No. to be used, select 1 or 2 for T1 or T2, respectively.



Choice 2 is only available when the TT or OT type is used.

9. Specify the cutting conditions. (See section 3.5 “Specifying Conditions When the Tangential Head is Selected.”)

Turn on the power and press a **function key from F1 to F4** to select the COND No.

F1	FORCE	Tool height	Cutter/creaser				F3
F2	SPEED	30	T 0	COND1	CUTTER	2	F4
CHANGE			OFFSET				
Cutting speed			Quality				

- **Creaser or Cutter setting**

Press the **F3** key repeatedly until CUTTER is displayed, then press the  **ENTER key**.

- **Specify a speed of 10 cm/s and a quality setting of 4.**



Use the setting values best suited to the various conditions involved, such as the medium to be cut and the cutting data.

- **Warnings for Tool Height and Cutting Force settings**

Top setting

Using the vacuum pump to secure the cutting mat (styrene board), adjust the blade tip height to match the medium thickness. Do this after flattening warped media and affixing the media to the application sheets.

Bottom setting

Remove the medium, use the vacuum pump to secure the cutting mat (styrene board), and adjust the blade tip so that it will cut to approximately 0.5 to 1.0 mm into the medium surface.

Specify a maximum cutting force of P = 100.

10. Load the medium. (See section 2.12 “Loading the Medium”.)

Turn off the FC3600. Flatten warped media, use the provided clear packaging tape to secure it firmly around the border, and turn on the vacuum pump. After confirming that the medium is secure and will resist moving when subjected to the cutting force, turn on the FC3600. Media that is not firmly secured may lead to accidents such as broken blades. **Make sure to confirm that media are secured each time cutting is performed.**

11. Specify the offset angle. (See section 4.21 “Specifying Offset Angle”.)

- Access OFST ANG in MENU mode.
- Specify ANGLE1 = 20°.
- Specify ANGLE2 = 15°, L1 = 0 mm, and L2 = 5 mm.

CHECKPOINT

Use the setting values best suited to the various conditions involved, such as the medium to be cut and the cutting data.

12. Specify repeat cutting and the number of cuts. (See section 4.14 "Setting Cutting Conditions in THICK Mode".)

- Access THICK in MENU mode.
- Specify the COND No. for which THICK settings are to be activated.
- Select ALL or LINE.

ALL : Repeat cutting is performed based on all the work data.

LINE : Repeat cutting is performed on a line-by-line basis.

- Specify the number of cuts.

XB57

Cardboard (1.5 mm)	: 3 times	Plastic sheets (1 mm)	: 5 times
Leather (2 mm)	: 3 times	Corrugated cardboard (E-flute)	: 2 times
Rubber (1.5 mm)	: 3 times		

BSB-13P

Cardboard (1.5 mm)	: 3 times	Leather (2 mm)	: 2 times
Corrugated cardboard (E-flute)	: 2 times	Rubber (2.5 mm)	: 3 times

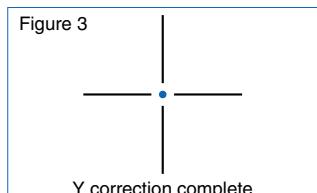
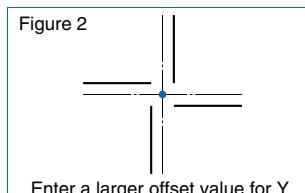
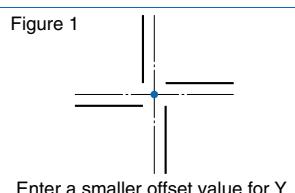
These are only guideline values.

CHECKPOINT

Use the setting values best suited to the various conditions involved, such as the medium to be cut and the cutting data.

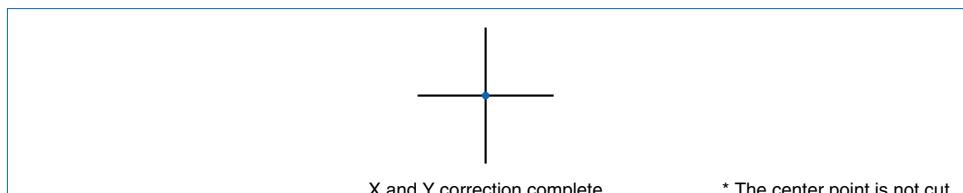
13. Specify the blade tip position offset. (See section 4.3 "Correcting the Blade Tip Position".)

- Access ADJ. R in MENU mode.
- Enter offset values of X = 0.3 and Y = 0.0, then press the **▲ TEST key** to cut the "+" symbol. If the results of cutting match Figure 1, enter a smaller value for Y.
- If the results match Figure 2, enter a larger value for Y. Continue adjusting the Y offset value until the results match Figure 3.



* The center point and dashed lines indicating correct positions are not actually cut.

- Upon completion of Y correction, enter a smaller offset value for X and repeat the correction process until the results match the figure shown below.



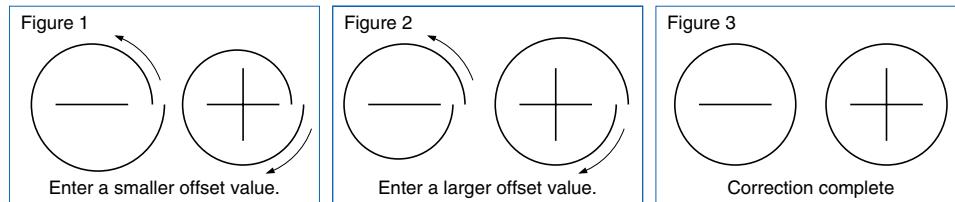
* The center point is not cut.

CHECKPOINT

- Mark the "+" symbol near the position (X-Y) used in the Top setting, as described in step 9 of the tool height adjustment in the cutting conditions.
- If the "+" symbol is not marked clearly, the Top setting in step 9 of the tool height adjustment in the cutting conditions may be too high. Specify a different value.

14. Specify the blade tip orientation offset. (See section 4.4 “Correcting the Blade Tip Orientation”.)

- Access T.DIR in MENU mode.
- After pressing the **▲ TEST key** to display the menu for test cutting selection, select CIRCLE to start the cutting.
- If the results of cutting match Figure 1, enter a smaller offset value. If the results match Figure 2, enter a larger value. Continue adjusting the offset until the results match Figure 3.



CHECKPOINT

When the start and end points for two circles fail to coincide, remember to specify offset values for minimal misalignment of the start and end points for both circles, rather than for the alignment of one circle only.

These settings are now complete.



CAUTION

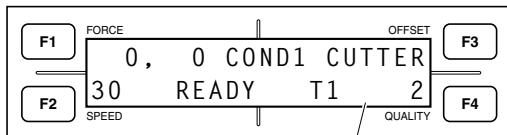
Be sure to turn on the vacuum pump before cutting.

5.2 Cutting with the XB157T Tool Holder Cutter Blade

Guidelines for media that can be cut with the XB157T: rubber (7 mm and under).

* Figure in parentheses indicates media thickness.

1. After confirming that the FC3600 has been turned off, remove the protective cover.
(See section 2.10 "Mounting the Protective Cover".)
2. Adjust the pen block height to suit the thickness of the media to be cut.
(See section 2.8 "Adjusting the Pen Block Height for Medium Thickness".)
3. If applicable, mount the optional material hold-down attachment.
(See section 2.9 "Mounting the Optional Material Hold-Down Attachment".)
4. Attach the protective cover.
(See section 2.10 "Mounting the Protective Cover".)
5. For the O or OT type, make the following settings:
 - **Switch the spring pressure.** (See section 2.5 "Mounting the Tool Holder".)
Lower the spring pressure adjuster on the tangential head 1 to the bottom position.
 - **Prepare the tool block.** (See section 6.2 "Settings for Special Functions.)
Press and hold the  POSITION key while turning the FC3600 on to display the special functions menu. Press the  NEXT PAGE key to display the TOOL BLOCK SETTING menu, then select CUTTER. Complete the settings and then turn off the power. When CUTTER is selected, O will not be shown on the READY status display.



Blank when the CUTTER is selected

6. Assemble the blade holder and tool holder.
(See section 2.4 "Mounting Cutter Blades".)

 **CAUTION**

- To avoid accidentally cutting yourself with the sharp blade, be particularly careful when handling the blade during assembly.
- Firmly tighten the screw. Loose screws may cause accidents.

7. Mount the tool holder on the tangential head.
(See section 2.5 "Mounting the Tool Holder".)

 **CAUTION**

- Insert the tool holder fully into the tangential head, and tighten the stopper screws. Loose screws may cause accidents.
- Tighten the stopper screws on the tangential heads even if nothing is mounted. If the screws come loose during operations accidents may result.

8. Select the tool head assigned to the COND No.
(See section 3.4 "Selecting the Tangential Head or Pen Block".)
After turning on the power, press the following keys sequentially to display the tool selection menu:
 NEXT PAGE →  (TOOL COND) →  (TOOL NO.).

F1	FORCE	COND No.	1	2	3	4	F3
F2	SPEED	TOOL No.	1	2	P	1	F4
					QUALITY		

In the COND No. to be used, select 1 or 2 for T1 or T2, respectively.

CHECKPOINT Choice 2 is only available when the TT or OT type is used.

9. Specify the cutting conditions. (See section 3.5 “Specifying Conditions When the Tangential Head is Selected.”)

Turn on the power and press a **function key from F1 to F4** to select the COND No.

Tool height	Cutter/creaser
F1 FORCE	T 0, 0 COND1 CUTTER
F2 SPEED	10 CHANGE T1 4
Cutting speed	Quality

- **Creaser or Cutter setting**

Press the **F3** key repeatedly until CUTTER is displayed, then press the **ENTER key**.

- **Specify a speed of 10 cm/s and a quality setting of 4.**

CHECKPOINT Use the setting values best suited to the various conditions involved, such as the medium to be cut and the cutting data.

- Warnings for tool height and Cutting Force settings

Top setting

Using the vacuum pump to secure the cutting mat (styrene board), adjust the blade tip height to match the medium thickness. Do this after flattening warped media and affixing the media to the application sheets.

Bottom setting

Remove the medium, use the vacuum pump to secure the cutting mat (styrene board), and adjust the blade tip so that it will cut to approximately 0.5 to 1.0 mm into the medium surface.

Specify a maximum cutting force of P = 100.

10. Load the medium. (See section 2.12 “Loading the Medium”.)

Turn off the FC3600. Flatten warped media, use the provided clear packaging tape to secure it firmly around the border, and turn on the vacuum pump. After confirming that the medium is secure and will resist moving when subjected to the cutting force, turn on the FC3600. Media that is not firmly secured may lead to accidents such as broken blades. **Make sure to confirm that media are secured each time cutting is performed.**

11. Specify the offset angle. (See section 4.21 “Specifying Offset Angle”.)

- Access OFST ANG in MENU mode.
- Specify ANGLE1 = 20°.
- Specify ANGLE2 = 15°, L1 = 0 mm, and L2 = 5 mm.

CHECKPOINT Use the setting values best suited to the various conditions involved, such as the medium to be cut and the cutting data.

12. Specify repeat cutting and the number of cuts. (See section 4.14 “Setting Cutting Conditions in THICK Mode”.)

- Access THICK in MENU mode.
- Specify the COND No. for which THICK settings are to be activated.
- Select ALL or LINE.

ALL : Repeat cutting is performed based on all the work data.

LINE : Repeat cutting is performed on a line-by-line basis.

- Specify the number of cuts.

Rubber (7 mm): 10 times

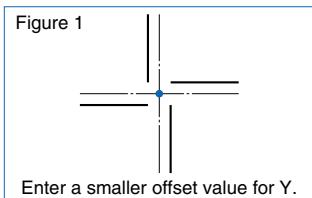
This is only a guideline value.

CHECKPOINT

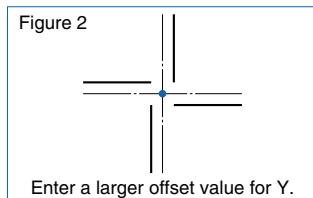
Use the setting values best suited to the various conditions involved, such as the medium to be cut and the cutting data.

13. Specify the blade tip position offset. (See section 4.3 “Correcting the Blade Tip Position”.)

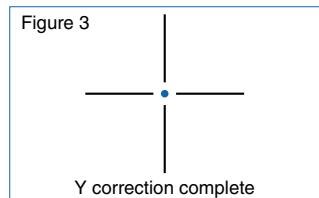
- Access ADJ. R in MENU mode.
- Enter offset values of X = 0.3 and Y = 0.0, then press the **▲ TEST key** to cut the “+” symbol. If the results of cutting match Figure 1, enter a smaller value for Y.
- If the results match Figure 2, enter a larger value for Y. Continue adjusting the Y offset value until the results match Figure 3.



Enter a smaller offset value for Y.



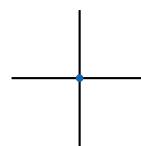
Enter a larger offset value for Y.



Y correction complete

* The center point and dashed lines indicating correct positions are not actually cut.

- Upon completion of Y correction, enter a smaller offset value for X and repeat the correction process until the results match the figure shown below.



X and Y correction complete

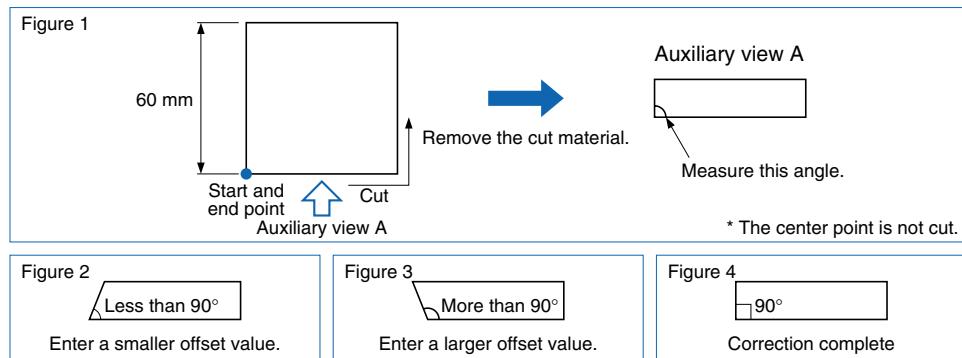
* The center point is not cut.

CHECKPOINT

- Mark the “+” symbol near the position (X-Y) used in the Top setting, as described in step 9 of the tool height adjustment in the cutting conditions.
- If the “+” symbol is not marked clearly, the Top setting in step 9 of the tool height adjustment in the cutting conditions may be too high. Specify a different value.

14. Specify the blade tip orientation offset. (See section 4.4 “Correcting the Blade Tip Orientation”.)

- Access T.DIR in MENU mode.
- After pressing the **▲ TEST key** to display the menu for test cutting selection, select SQUARE to start the cutting. Remove the medium cut as shown in Figure 1, and measure the side angles.
- If the results of cutting match Figure 2, enter a smaller offset value. If the results match Figure 3, enter a larger value. Continue adjusting the offset until the results match Figure 4.



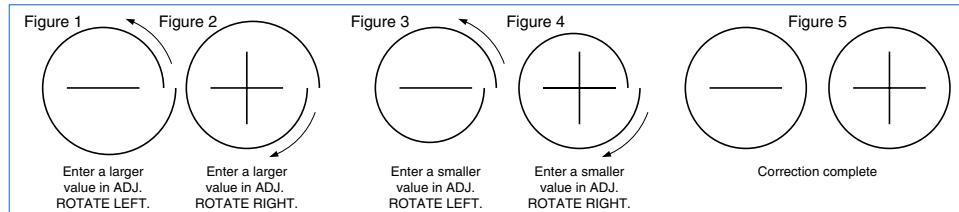
CHECKPOINT

- Use a drafting triangle to confirm that an angle is perpendicular.
- Rubber media is often warped, so check on a flat surface, being sure to hold it down from above.



15. Specify the circular offset. (See section 4.5 "Correcting circles".)

- Access ADJ.C in MENU mode.
- Press the **F4** key (ADJ. R) and the **▲ TEST** key to display the menu for test cutting selection. Next, press the **F2** key (CIRCLE) to cut two circles with different rotation directions (clockwise and counterclockwise). The circle indicated by the minus sign is cut counterclockwise, and the circle indicated by the plus sign is cut clockwise.
- **Counterclockwise adjustment**
If the cutting results match Figure 1, enter a larger value in ADJ. ROTATE LEFT area. If the cutting results match Figure 3, enter a smaller value. Repeat the correction process until the results match Figure 5. Aim for incremental corrections of 25% to 30% until the points are nearly aligned, then perform fine-tuning by entering corrective values in 1% increments.
- **Clockwise adjustment**
If the cutting results match Figure 2, enter a larger value in ADJ. ROTATE RIGHT area. If the cutting results match Figure 4, enter a smaller value. Repeat the correction process until the results match Figure 5. Aim for incremental corrections of 25% to 30% until the points are nearly aligned, then perform fine-tuning by entering corrective values in 1% increments.



CHECKPOINT

In some cases, the cutting results will be a combination of 1 and 4, or 2 and 3.

⚠ CAUTION

Correction made with excessive force may cause notches on the finished surface.

These settings are now complete.

⚠ CAUTION

Be sure to turn on the vacuum pump before cutting.

5.3 Cutting with the CB30U-OS20 Oscillation Cutter Blade, Part 1

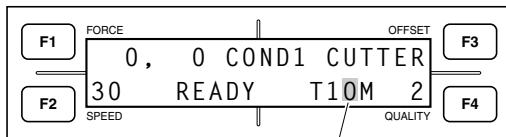
Adjustment instructions for cutting styrene board (12.5 mm or less) or Styrofoam (12.5 mm or less)

* Figures in parentheses indicate media thickness.



The CB30U-OS20 can only be mounted with the O or OT types.

1. After confirming that the FC3600 has been turned off, remove the protective cover.
(See section 2.10 "Mounting the Protective Cover".)
2. Adjust the pen block height to suit the thickness of the media to be cut.
(See section 2.8 "Adjusting the Pen Block Height for Medium Thickness".)
3. If applicable, mount the optional material hold-down attachment.
(See section 2.9 "Mounting the Optional Material Hold-Down Attachment".)
4. Attach the protective cover.
(See section 2.10 "Mounting the Protective Cover".)
5. Switch the spring pressure. (See section 2.5 "Mounting the Tool Holder".)
Raise the spring pressure adjuster on the tangential head 1 to the top position.
6. Prepare the tool block. (See section 6.2 "Settings for Special Functions.)
Press and hold the ▽ **POSITION** key while turning the FC3600 on to display the special functions menu. Press the **NEXT PAGE** key to display the TOOL BLOCK SETTING menu, then select OSCIL. Complete the settings and then turn off the power. When OSCIL. is selected, O will be shown on the READY status display.



OSCILLATION mode is indicated by an "O" here.



CAUTION Oscillation (up and down vibration) will not occur if these settings are not completed, which may lead to accidents, such as broken blades. Be sure to specify OSCIL.

7. Assemble the blade holder and oscillation unit.
(See section 2.4 "Mounting Cutter Blades".)



- To avoid accidentally cutting yourself with the sharp blade, be particularly careful when handling the blade during assembly.
- Firmly tighten the screw. Loose screws may cause accidents.

8. Mount the oscillation unit on the tangential head 1 (T1).
(See section 2.6 "Mounting the Oscillation Unit".)



- Insert the oscillation unit fully into the tangential head, and tighten the stopper screws. Loose screws may cause accidents.
- Tighten the stopper screws on the tangential heads even if nothing is mounted. If the screws come loose during operations accidents may result.



Only tangential head 1 (T1) supports mounting of the oscillation unit.

9. Select the tool head assigned to the COND No

(See section 3.4 “Selecting the Tangential Head or Pen Block”.)

After turning on the power, press the following keys sequentially to display the tool selection menu:

 **NEXT PAGE → F3 (TOOL COND) → F2 (TOOL NO.).**

F1	FORCE		OFFSET	F3
COND		No.	1 2 3 4	
F2	TOOL	No.	1 2 P 1	F4
SPEED			QUALITY	

In the COND No. to be used, select 1 for T1.

10. Specify the cutting conditions. (See section 3.5 “Specifying Conditions When the Tangential Head is Selected.)

Turn on the power and press a **function key** from **F1** to **F4** to select the COND No.

- Creaser or Cutter setting

Press the **F3** key repeatedly until CUTTER is displayed, then press the **ENTER** key.

- Specify a speed of 5 cm/s and a quality setting of 4.

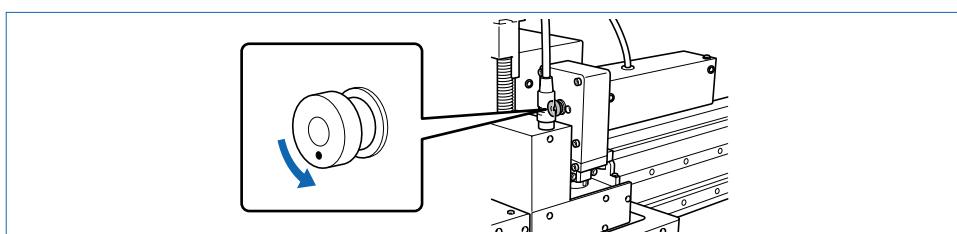
CHECKPOINT

Use the setting values best suited to the various conditions involved, such as the medium to be cut and the cutting data.

- **Tool Height and Cutting Force settings**

Top setting

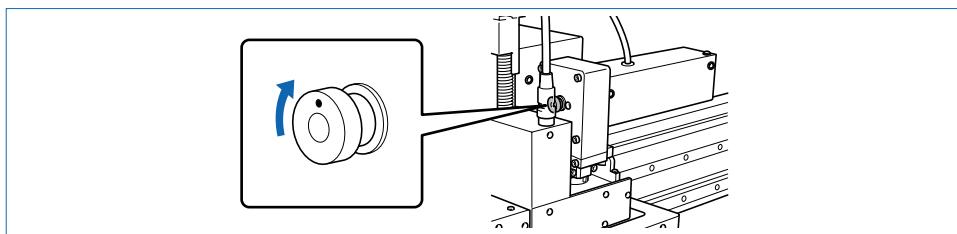
Lower the oscillation unit blade tip



Using the vacuum pump to secure the felt cutting mat, adjust the blade tip height to match the medium thickness.

Bottom setting

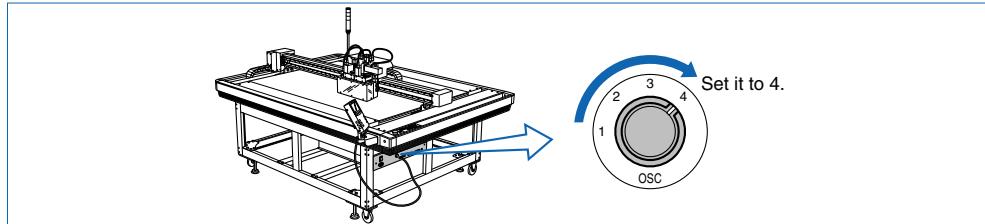
Raise the oscillation unit blade tip.



Remove the medium, use the vacuum pump to secure the felt cutting mat, and adjust the blade tip so that it will cut to approximately 1.5 to 2 mm into the medium surface (half the triangular portion of the blade tip).

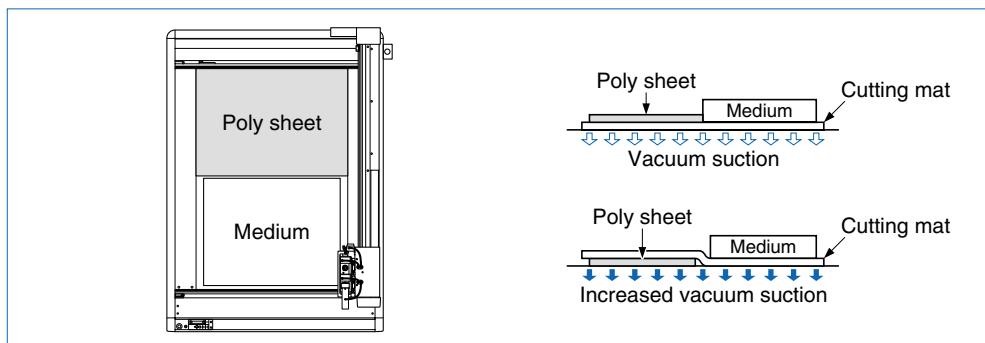
Specify a maximum cutting force of $P = 100$.

11. Turn the OSC control dial to 4.



12. Load the medium. (See section 2.12 "Loading the Medium".)

Turn off the FC3600. After loading the medium, turn on the vacuum pump to secure it. After confirming that the medium is firmly secured and will resist moving when subjected to the cutting force, turn on the FC3600. Be careful at this point, since media that are not firmly secured may cause accidents, such as broken blades. To cover the bare areas outside the media area, use a commercially available poly sheet. Vacuum suction can be enhanced by laying the poly sheet under the felt below the bare areas. If the medium is too small to be held by the vacuum and cannot be affixed, cover the medium and the entire cutting mat with a poly sheet. **Be sure to confirm that media are secured each time cutting is performed.**



CHECKPOINT

When affixing the medium, check which surface is the warping surface and load it as shown below. The suction power varies depending on the direction of the warping.



13. Specify the offset angle. (See section 4.21 "Specifying Offset Angle".)

- Access OFST ANG in MENU mode.
- Specify ANGLE1 = 15°.
- Specify ANGLE2 = 10°, L1 = 0 mm, and L2 = 5 mm.

CHECKPOINT

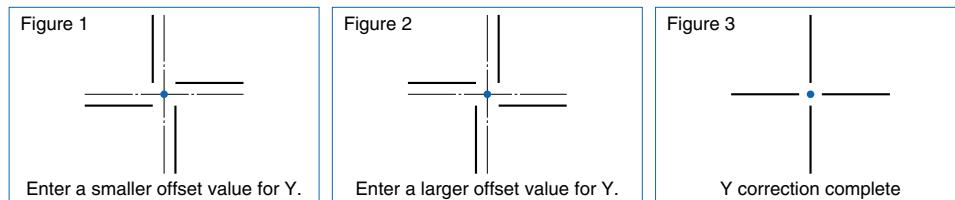
Use the setting values best suited to the various conditions involved, such as the medium to be cut and the cutting data.

14. Specify repeat cutting and the number of cuts. (See section 4.14 “Setting Cutting Conditions in THICK Mode”.)

- Access THICK in MENU mode.
- Specify the COND No. for which THICK settings are to be activated.
- Select ALL or LINE.
- Specify the number of cuts: 1

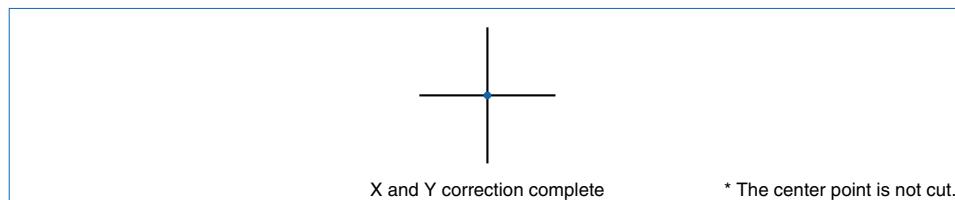
15. Specify the blade tip position offset. (See section 4.3 “Correcting the Blade Tip Position”.)

- Access ADJ. R in MENU mode.
- Enter offset values of $X = 0.3$ and $Y = 0.0$, then press the **TEST key** to cut the “+” symbol.
- If the results of cutting match Figure 1, enter a smaller value for Y. If the results match Figure 2, enter a larger value for Y. Continue adjusting the Y offset value until the results match Figure 3.



* The center point and dashed lines indicating correct positions are not actually cut.

- Upon completion of Y correction, enter a smaller offset value for X and repeat the correction process until the results match the figure shown below.

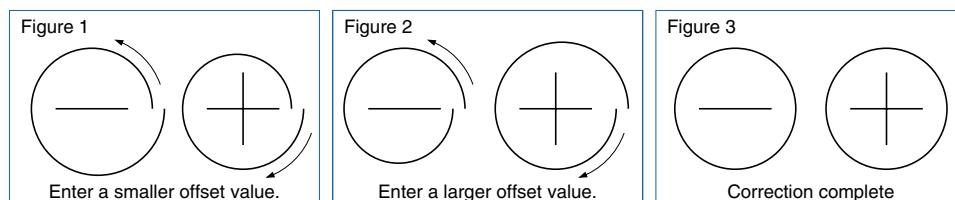


CHECKPOINT

- Mark the “+” symbol near the position (X-Y) used in the Top setting, as described in step 10 of the tool height adjustment in the cutting conditions.
- If the “+” symbol is not marked clearly, the Top setting in step 10 of the tool height adjustment in the cutting conditions may be too high. Specify a different value.

16. Specify the blade tip orientation offset. (See section 4.4 “Correcting the Blade Tip Orientation”.)

- Access T.DIR in MENU mode.
- After pressing the **TEST key**, select CIRCLE to start the cutting.
- If the results of cutting match Figure 1, enter a smaller offset value. If the results match Figure 2, enter a larger value. Continue adjusting the offset until the results match Figure 3.



CHECKPOINT

- When the start and end points for two circles fail to coincide, remember to specify offset values for minimal misalignment of the start and end points for both circles, rather than for the alignment of one circle only.

These settings are now complete.

 **CAUTION** Be sure to turn on the vacuum pump before cutting.

5.4 Cutting with the CB30U-OS20 Oscillation Cutter Blade, Part 2

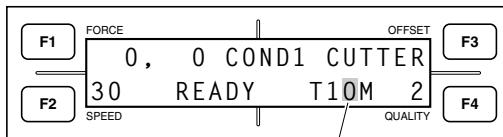
Adjustment instructions for cutting urethane foam (12.5 mm or less)

* Figure in parentheses indicates media thickness.



The CB30U-OS20 can only be mounted with the O or OT types.

1. After confirming that the FC3600 has been turned off, remove the protective cover.
(See section 2.10 "Mounting the Protective Cover".)
2. Adjust the pen block height to suit the thickness of the media to be cut.
(See section 2.8 "Adjusting the Pen Block Height for Medium Thickness".)
3. If applicable, mount the optional material hold-down attachment.
(See section 2.9 "Mounting the Optional Material Hold-Down Attachment".)
4. Attach the protective cover.
(See section 2.10 "Mounting the Protective Cover".)
5. Switch the spring pressure. (See section 2.5 "Mounting the Tool Holder").
Raise the spring pressure adjuster on the tangential head 1 to the top position.
6. Prepare the tool block. (See section 6.2 "Settings for Special Functions.)
Press and hold the POSITION key while turning the FC3600 on to display the special functions menu. Press the NEXT PAGE key to display the TOOL BLOCK SETTING menu, then select OSCIL. Complete the settings and then turn off the power. When OSCIL. is selected, O will be shown on the READY status display.



OSCILLATION mode is indicated by an "O" here.



CAUTION Oscillation (up and down vibration) will not occur if these settings are not completed, which may lead to accidents, such as broken blades. Be sure to specify OSCIL.

7. Assemble the blade holder and oscillation unit.
(See section 2.4 "Mounting Cutter Blades".)



- To avoid accidentally cutting yourself with the sharp blade, be particularly careful when handling the blade during assembly.
- Firmly tighten the screw. Loose screws may cause accidents.

8. Mount the oscillation unit on the tangential head 1 (T1).
(See section 2.6 "Mounting the Oscillation Unit".)



- Insert the oscillation unit fully into the tangential head, and tighten the stopper screws. Loose screws may cause accidents.
- Tighten the stopper screws on the tangential heads even if nothing is mounted. If the screws come loose during operations accidents may result.

CHECKPOINT

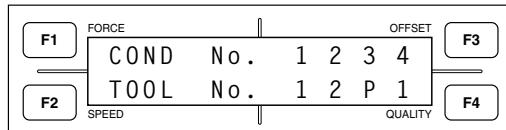
Only tangential head 1 (T1) supports mounting of the oscillation unit.

9. Select the tool head assigned to the COND No.

(See section 3.4 "Selecting the Tangential Head or Pen Block".)

After turning on the power, press the following keys sequentially to display the tool selection menu:

 **NEXT PAGE** → **F3** (TOOL COND) → **F2** (TOOL NO.).



In the COND No. to be used, select 1 for T1.

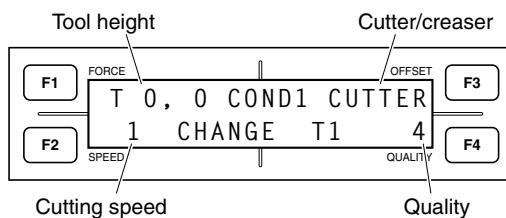
10. Specify the cutting conditions for blade tip position offset.

(See section 3.5 "Specifying Conditions When the Tangential Head is Selected".)

Prepare media such as corrugated cardboard, cardboard, styrofoam, or styrene board (12.5 mm or less) for blade tip position offset since urethane cannot be used for the offset procedure in step 16.

 **CAUTION** Do not use hard media such as plastic sheets, rubber, or other rigid media for the blade tip offset. Using these hard media for the offset procedure may result in broken blades.

Turn on the power and press a **function key** from **F1** to **F4** to select the COND No.



- **Creaser or Cutter setting**

Press the **F3** key repeatedly until CUTTER is displayed, then press the  **ENTER key**.

- **Specify a speed of 1 cm/s and a quality setting of 4.**

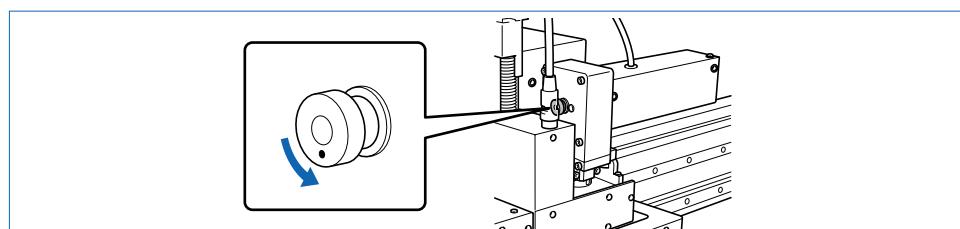
CHECKPOINT

Use the setting values best suited to the various conditions involved, such as the medium to be cut and the cutting data.

- **Tool Height and Cutting Force settings**

Top setting

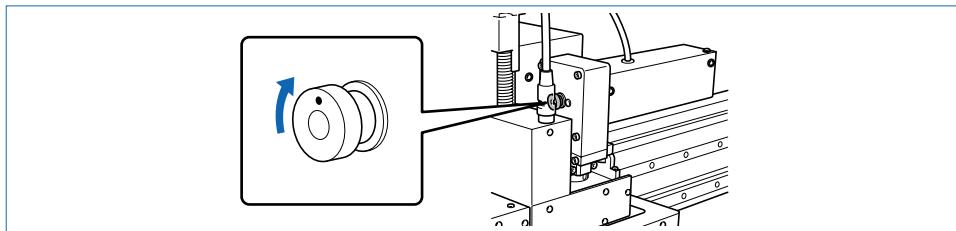
Lower the oscillation unit blade tip.



Using the vacuum pump to secure the felt cutting mat, adjust the blade tip height to match the medium thickness.

Bottom setting

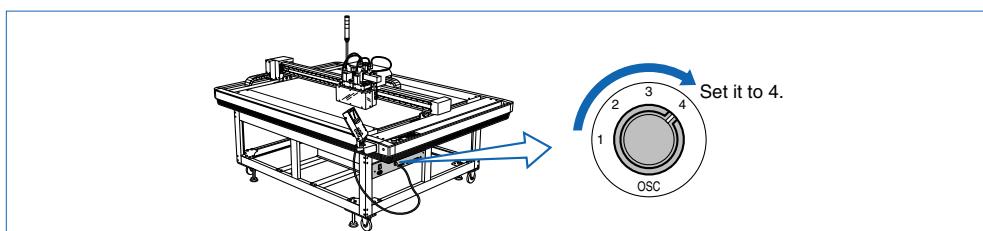
Raise the oscillation unit blade tip.



Remove the medium, use the vacuum pump to secure the felt cutting mat, and adjust the blade tip so that it will cut to approximately 1.5 to 2 mm into the medium surface (half the triangular portion of the blade tip) when down.

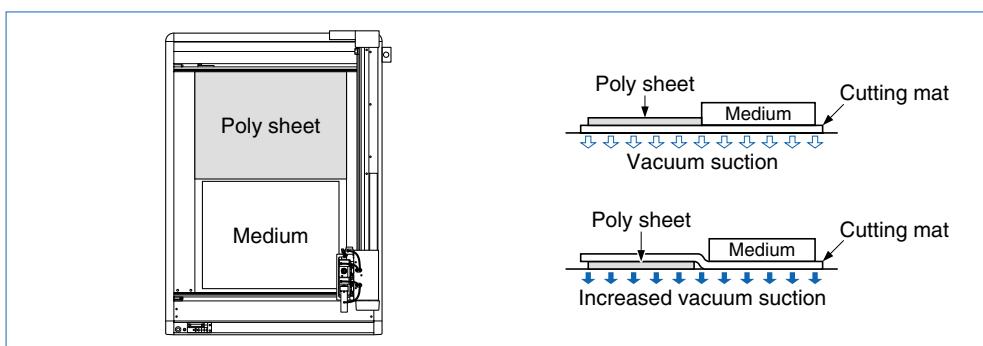
Specify a maximum cutting force of $P = 100$.

11. Turn the OSC control dial to 4.



12. Load the medium. (See section 2.12 "Loading the Medium".)

Turn off the FC3600. After loading the medium, turn on the vacuum pump to secure it. After confirming that the medium is firmly secured and will resist moving when subjected to the cutting force, turn on the FC3600. Be careful at this point, since media that are not firmly secured may cause accidents, such as broken blades. To cover the bare areas outside the media area, use a commercially available poly sheet. Vacuum suction can be enhanced by laying the poly sheet under the felt below the bare areas. If the medium is too small to be held by the vacuum and cannot be affixed, cover the medium with a poly sheet. **Be sure to confirm that media are secured each time cutting is performed.**



CHECKPOINT

When affixing the medium, check which surface is the warping surface and load it as shown below. The suction power varies depending on the direction of the warping.



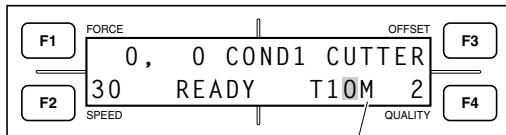
13. Complete the Perforation settings. (See section 4.25 “Setting Perforation”.) For soft media such as urethane foam, specify $U = 0$ so that work proceeds with a pause for each cut segment.

- Access C LINE PAT. in MENU mode.
- Specify $C = 0.5$ and $U = 0$ mm.

CHECKPOINT

Specify the value for C best suited to the various conditions, such as the medium to be cut and the cutting data.

- When CUT LINE is selected, M will be shown on the READY status display.



PERFORATION mode is indicated here by an “M”.

- Access CUT WAIT SETTING in MENU mode. Specify the pause period during perforation cutting.
- Specify CUT WAIT SETTING = 100 msec.

(See page 4-3 “Settings Tool-Down Standby Time”.)

CHECKPOINT

Use the setting values best suited to the various conditions, such as the medium to be cut and the cutting data.

14. Specify the offset angle. (See section 4.21 “Specifying Offset Angle”.)

- Access OFST ANG in MENU mode.
- Specify ANGLE1 = 15°.
- Specify ANGLE2 = 10°, L1 = 0 mm, and L2 = 5 mm.

CHECKPOINT

Use the setting values best suited to the various conditions, such as the medium to be cut and the cutting data.

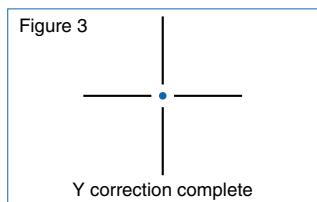
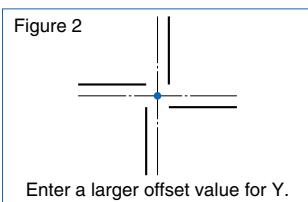
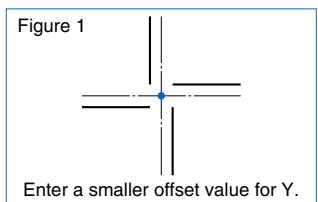
15. Specify repeat cutting and the number of cuts. (See section 4.14 “Setting Cutting Conditions in THICK Mode”.)

- Access THICK in MENU mode.
- Specify the COND No. for which THICK settings are to be activated.
- Select ALL or LINE.
- Specify the number of cuts: 1

16. Specify the blade tip position offset. (Use the same medium as prepared in step 10.)

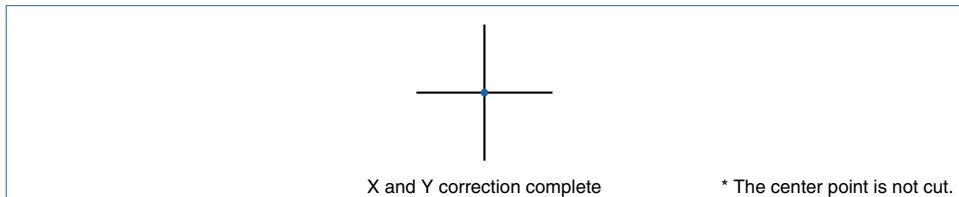
(See section 4.3 “Correcting the Blade Tip Position”.)

- Access ADJ. R in MENU mode.
- Enter offset values of $X = 0.3$ and $Y = 0.0$, then press the **TEST** key to cut the “+” symbol.
- If the results of cutting match Figure 1, enter a smaller value for Y . If the results match Figure 2, enter a larger value for Y . Continue adjusting the Y offset value until the results match Figure 3.



* The center point and dashed lines indicating correct positions are not actually cut.

- Upon completion of Y correction, enter a smaller offset value for X and repeat the correction process until the results match the figure shown below.



CHECKPOINT/

- Mark the “+” symbol near the position (X-Y) used in the Top setting, as described in step 10 of the tool height adjustment in the cutting conditions.
- If the “+” symbol is not marked clearly, the Top setting in step 10 of the tool height adjustment in the cutting conditions may be too high. Specify a different value.

17. Specify the actual tool height for cutting urethane foam.

(See section 3.5 “Specifying Conditions When the Tangential Head is Selected.)

• Tool Height and Cutting Force settings

Top setting

Lower the oscillation unit blade tip.

Using the vacuum pump to secure the felt cutting mat, adjust the blade tip height to match the medium thickness.

Bottom setting

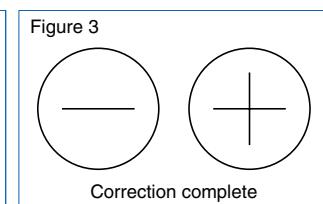
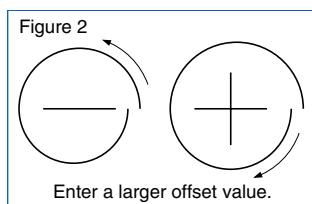
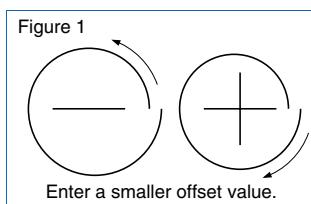
Raise the oscillation unit blade tip. Remove the urethane foam, use the vacuum pump to secure the felt cutting mat, and adjust the blade tip so that it will cut to approximately 1.5 to 2 mm into the medium surface (half the triangular portion of the blade tip).

18. Load the urethane foam. (See section 2.12 “Loading the Medium”.)

Turn off the FC3600. After loading the medium, turn on the vacuum pump to secure it. After confirming that the medium is firmly secured and will resist moving when subjected to the cutting force, turn on the FC3600. Be careful at this point, since media that are not firmly secured may cause accidents, such as broken blades. Because urethane foam is a porous material through which air can pass, cover it with a commercially available poly sheet to secure it. To cover the bare areas outside the media area, use a commercially available poly sheet. Vacuum suction can be enhanced by laying the poly sheet under the felt below the bare areas. If the medium is too small to be held by the vacuum and cannot be affixed, cover the medium with a poly sheet. **Be sure to confirm that media are secured each time cutting is performed.**

19. Specify the blade tip orientation offset. (See section 4.4 “Correcting the Blade Tip Orientation”.)

- Access T.DIR in MENU mode.
- After pressing the **TEST key**, select CIRCLE to start the cutting.
- If the results of cutting match Figure 1, enter a smaller offset value. If the results match Figure 2, enter a larger value. Continue adjusting the offset until the results match Figure 3.



CHECKPOINT 

When the start and end points for two circles fail to coincide, remember to specify offset values for minimal misalignment of the start and end points for both circles, rather than for the alignment of one circle only.

These settings are now complete.

 **CAUTION** Be sure to turn on the vacuum pump before cutting.

5.5 Cutting with the CB30U-OS40 Oscillation Cutter Blade, Part 1

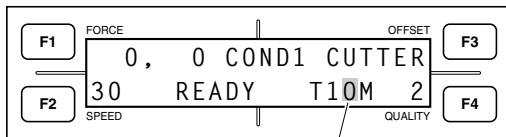
Adjustment instructions for cutting styrene board (25 mm) or Styrofoam (12.5 to 30 mm)

* Figures in parentheses indicate media thickness.



The CB30U-OS40 can only be mounted with the O or OT types.

1. After confirming that the FC3600 has been turned off, remove the protective cover.
(See section 2.10 "Mounting the Protective Cover".)
2. Adjust the pen block height to suit the thickness of the media to be cut.
(See section 2.8 "Adjusting the Pen Block Height for Medium Thickness".)
3. If applicable, mount the optional material hold-down attachment.
(See section 2.9 "Mounting the Optional Material Hold-Down Attachment".)
4. Attach the protective cover.
(See section 2.10 "Mounting the Protective Cover".)
5. Switch the spring pressure. (See section 2.5 "Mounting the Tool Holder").
Raise the spring pressure adjuster on the tangential head 1 to the top position.
6. Prepare the tool block. (See section 6.2 "Settings for Special Functions.)
Press and hold the POSITION key while turning the FC3600 on to display the special functions menu. Press the NEXT PAGE key to display the TOOL BLOCK SETTING menu, then select OSCIL. Complete the settings and then turn off the power. When OSCIL. is selected, O will be shown on the READY status display.



OSCILLATION mode is indicated by an "O" here.



CAUTION Oscillation (up and down vibration) will not occur if these settings are not completed, which may lead to accidents, such as broken blades. Be sure to specify OSCIL.

7. Assemble the blade holder and oscillation unit.

(See section 2.4 "Mounting Cutter Blades".)



- To avoid accidentally cutting yourself with the sharp blade, be particularly careful when handling the blade during assembly.
- Firmly tighten the screw. Loose screws may cause accidents.

8. Mount the oscillation unit on the tangential head 1 (T1).

(See section 2.6 "Mounting the Oscillation Unit".)



- Insert the oscillation unit fully into the tangential head, and tighten the stopper screws. Loose screws may cause accidents.
- Tighten the stopper screws on the tangential heads even if nothing is mounted. If the screws come loose during operations accidents may result.



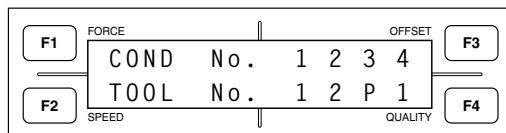
Only tangential head 1 (T1) supports mounting of the oscillation unit.

9. Select the tool head assigned to the COND No.

(See section 3.4 “Selecting the Tangential Head or Pen Block”.)

After turning on the power, press the following keys sequentially to display the tool selection menu:

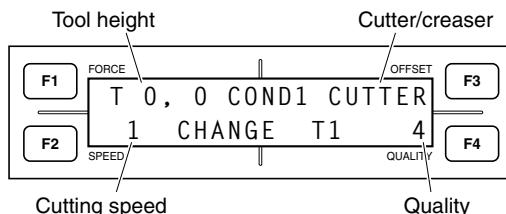
NEXT PAGE → **F3** (TOOL COND) → **F2** (TOOL NO.).



In the COND No. to be used, select 1 for T1.

10. Specify the cutting conditions. (See section 3.5 “Specifying Conditions When the Tangential Head is Selected.”)

Turn on the power and press a **function key from F1 to F4** to select the COND No.



- Creaser or Cutter setting**

Press the **F3** key repeatedly until CUTTER is displayed, then press the **ENTER key**.

- Specify a speed of 1 cm/s and a quality setting of 4.**

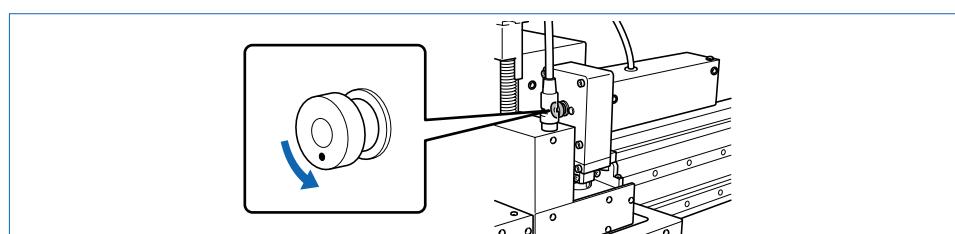


Use the setting values best suited to the various conditions involved, such as the medium to be cut and the cutting data.

- Tool Height and Cutting Force settings**

Top setting

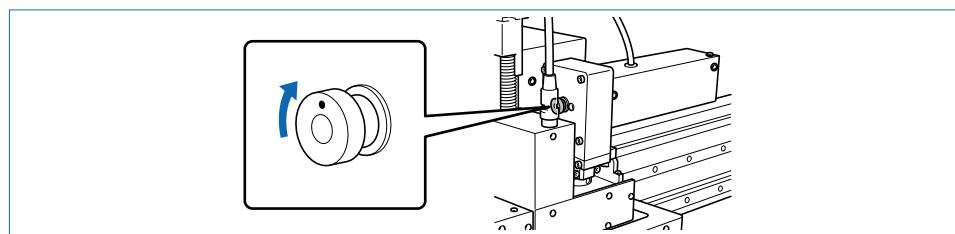
Lower the oscillation unit blade tip.



Using the vacuum pump to secure the felt cutting mat, adjust the blade tip height to match the medium thickness.

Bottom setting

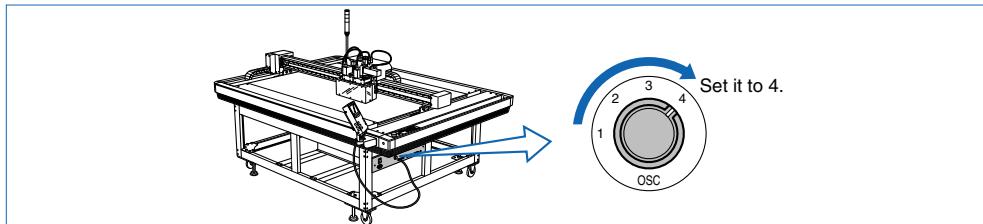
Raise the oscillation unit blade tip.



Remove the medium, use the vacuum pump to secure the felt cutting mat, and adjust the blade tip so that it will cut to approximately 1.5 to 2 mm into the medium surface (half the triangular portion of the blade tip).

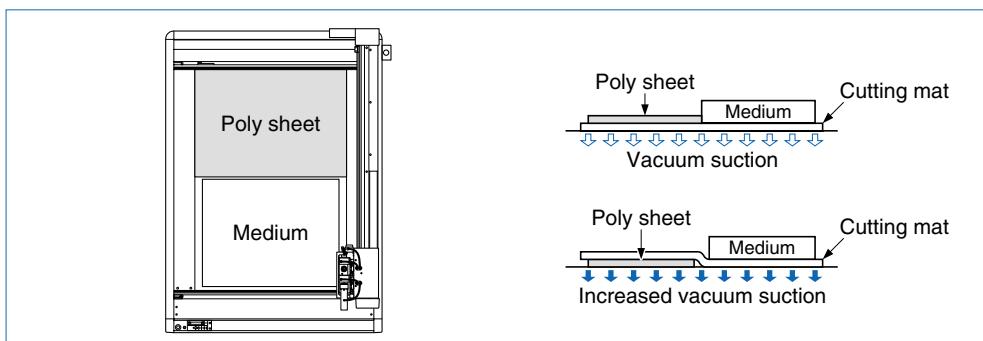
Specify a maximum cutting force of $P = 100$.

11. Turn the OSC control dial to 4.



12. Load the medium. (See section 2.12 “Loading the Medium”.)

Turn off the FC3600. After loading the medium, turn on the vacuum pump to secure it. After confirming that the medium is firmly secured and will resist moving when subjected to the cutting force, turn on the FC3600. Be careful at this point, since media that are not firmly secured may cause accidents, such as broken blades. To cover the bare areas outside the media area, use a commercially available poly sheet. Vacuum suction can be enhanced by laying the poly sheet under the felt below the bare areas. If the medium is too small to be held by the vacuum and cannot be affixed, cover the medium with a poly sheet. **Be sure to confirm that media are secured each time cutting is performed.**



CHECKPOINT

When affixing the medium, check which surface is the warping surface and load it as shown below. The suction power varies depending on the direction of the warping.



13. Specify the offset angle. (See section 4.21 “Specifying Offset Angle”.)

- Access OFST ANG in MENU mode.
- Specify ANGLE1 = 8°.
- Specify ANGLE2 = 2°, L1 = 1 mm, and L2 = 4 mm.

CHECKPOINT

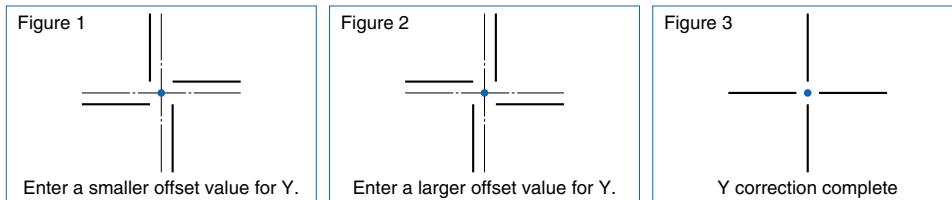
Use the setting values best suited to the various conditions, such as the medium to be cut and the cutting data.

14. Specify repeat cutting and the number of cuts. (See section 4.14 “Setting Cutting Conditions in THICK Mode”.)

- Access THICK in MENU mode.
- Specify the COND No. for which THICK settings are to be activated. - Select ALL or LINE.
- Specify the number of cuts: 1

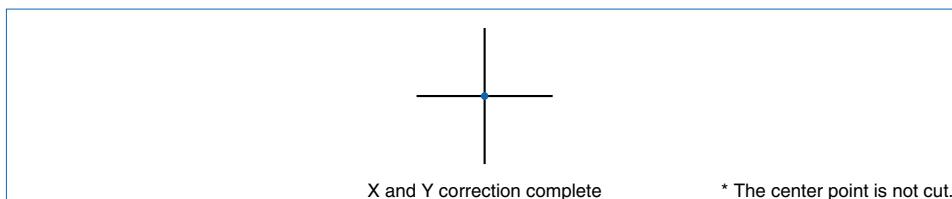
15. Specify the blade tip position offset. (See section 4.3 “Correcting the Blade Tip Position”.)

- Access ADJ. R in MENU mode.
- Enter offset values of X = 0.3 and Y = 0.0, then press the **▲ TEST key** to cut the “+” symbol.
- If the results of cutting match Figure 1, enter a smaller value for Y. If the results match Figure 2, enter a larger value for Y. Continue adjusting the Y offset value until the results match Figure 3.



* The center point and dashed lines indicating correct positions are not actually cut.

- Upon completion of Y correction, enter a smaller offset value for X and repeat the correction process until the results match the figure shown below.

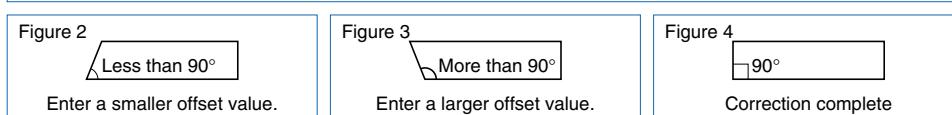
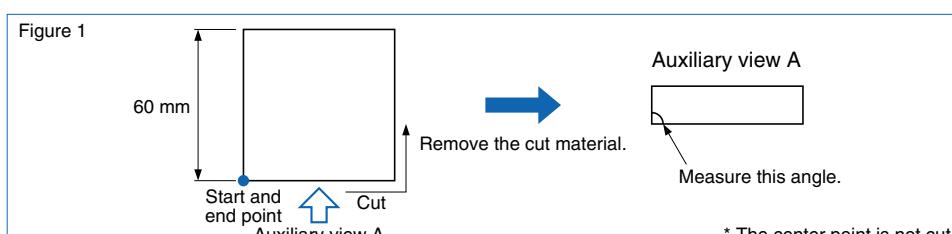


CHECKPOINT

- Mark the “+” symbol near the position (X-Y) used in the Top setting, as described in step 10 of the tool height adjustment in the cutting conditions.
- If the “+” symbol is not marked clearly, the Top setting in step 10 of the tool height adjustment in the cutting conditions may be too high. Specify a different value.

16. Specify the blade tip orientation offset. (See section 4.4 “Correcting the Blade Tip Orientation”.)

- Access T.DIR in MENU mode.
- After pressing the **▲ TEST key** to display the menu for test cutting selection, select CIRCLE to start the cutting.
- Remove the medium cut as shown in Figure 1, and measure the side angles. If the results of cutting match Figure 2, enter a smaller offset value. If the results match Figure 3, enter a larger value. Continue adjusting the offset until the results match Figure 4.



CHECKPOINT

Use a drafting triangle to confirm that an angle is perpendicular.

17. Specify the circular offset. (See section 4.5 “Correcting circles”.)

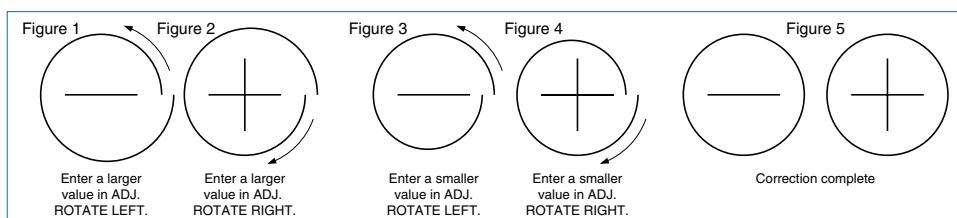
- Access ADJ.C in MENU mode.
- Press the **F4** key (ADJ. R) and the **▲ TEST** key to display the menu for test cutting selection. Next, press the **F2** key (CIRCLE) to cut two circles with different rotation directions (clockwise and counterclockwise). The circle indicated by the minus sign is cut counterclockwise, and the circle indicated by the plus sign is cut clockwise.

• Counterclockwise adjustment

If the cutting results match Figure 1, enter a larger value in ADJ. ROTATE LEFT area. If the cutting results match Figure 3, enter a smaller value. Repeat the correction process until the results match Figure 5. Aim for incremental corrections of 25% to 30% until the points are nearly aligned, then perform fine-tuning by entering corrective values in 1% increments.

• Clockwise adjustment

If the cutting results match Figure 2, enter a larger value in ADJ. ROTATE RIGHT area. If the cutting results match Figure 4, enter a smaller value. Repeat the correction process until the results match Figure 5. Aim for incremental corrections of 25% to 30% until the points are nearly aligned, then perform fine-tuning by entering corrective values in 1% increments.



CHECKPOINT

In some cases, the cutting results will be a combination of 1 and 4, or 2 and 3.

These settings are now complete.



CAUTION Be sure to turn on the vacuum pump before cutting.

5.6 Cutting with the CB30U-OS40 Oscillation Cutter Blade, Part 2

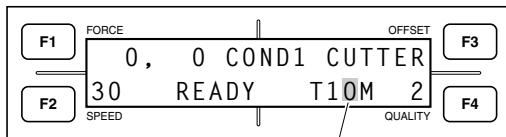
Adjustment instructions for cutting urethane foam (12.5 to 30 mm)

* Figures in parentheses indicate media thickness.



The CB30U-OS40 can only be mounted with the O or OT types.

1. After confirming that the FC3600 has been turned off, remove the protective cover.
(See section 2.10 "Mounting the Protective Cover".)
2. Adjust the pen block height to suit the thickness of the media to be cut.
(See section 2.8 "Adjusting the Pen Block Height for Medium Thickness".)
3. If applicable, mount the optional material hold-down attachment.
(See section 2.9 "Mounting the Optional Material Hold-Down Attachment".)
4. Attach the protective cover.
(See section 2.10 "Mounting the Protective Cover".)
5. Switch the spring pressure. (See section 2.5 "Mounting the Tool Holder".)
Raise the spring pressure adjuster on the tangential head 1 to the top position.
6. Prepare the tool block. (See section 6.2 "Settings for Special Functions.)
Press and hold the ▽ **POSITION** key while turning the FC3600 on to display the special functions menu. Press the **NEXT PAGE** key to display the TOOL BLOCK SETTING menu, then select OSCIL. Complete the settings and then turn off the power. When OSCIL. is selected, O will be shown on the READY status display.



OSCILLATION mode is indicated by an "O" here.

CAUTION Oscillation (up and down vibration) will not occur if these settings are not completed, which may lead to accidents, such as broken blades. Be sure to specify OSCIL.

7. Assemble the blade holder and oscillation unit.
(See section 2.4 "Mounting Cutter Blades".)

CAUTION

- To avoid accidentally cutting yourself with the sharp blade, be particularly careful when handling the blade during assembly.
- Firmly tighten the screw. Loose screws may cause accidents.

8. Mount the oscillation unit on the tangential head 1 (T1).
(See section 2.6 "Mounting the Oscillation Unit".)

CAUTION

- Insert the oscillation unit fully into the tangential head, and tighten the stopper screws. Loose screws may cause accidents.
- Tighten the stopper screws on the tangential heads even if nothing is mounted. If the screws come loose during operations accidents may result.



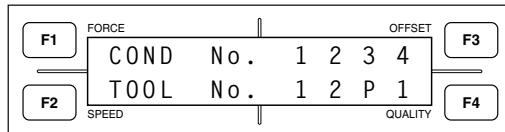
Only tangential head 1 (T1) supports mounting of the oscillation unit.

9. Select the tool head assigned to the COND No.

(See section 3.4 “Selecting the Tangential Head or Pen Block”.)

After turning on the power, press the following keys sequentially to display the tool selection menu:

NEXT PAGE → **F3 (TOOL COND)** → **F2 (TOOL NO.)**.



In the COND No. to be used, select 1 for T1.

10. Specify the cutting conditions for blade tip position offset.

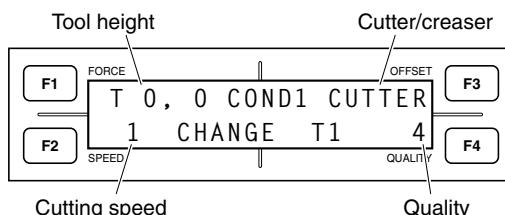
(See section 3.5 “Specifying Conditions When the Tangential Head is Selected.”)

Prepare media such as corrugated cardboard, cardboard, styrofoam (30 mm or less), or styrene board (25 mm or less) for blade tip position offset since urethane cannot be used for the offset procedure in step 16.



CAUTION Do not use hard media such as plastic sheets, rubber, or other rigid media for the blade tip offset. Using these hard media for offset procedure may result in broken blades.

Turn on the power and press a **function key from F1 to F4** to select the COND No.



- **Creaser or Cutter setting**

Press the **F3** key repeatedly until CUTTER is displayed, then press the **ENTER key**.

- **Specify a speed of 1 cm/s and a quality setting of 4.**

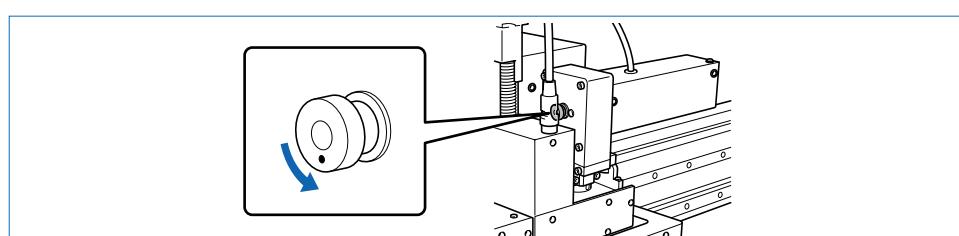


Use the setting values best suited to the various conditions involved, such as the medium to be cut and the cutting data.

- **Tool Height and Cutting Force settings**

Top setting

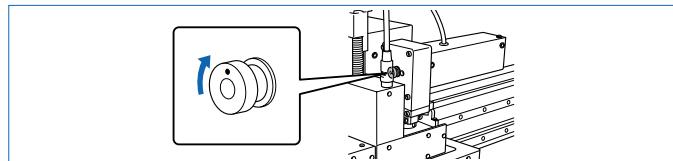
Lower the oscillation unit blade tip.



Using the vacuum pump to secure the felt cutting mat, adjust the blade tip height to match the medium thickness.

Bottom setting

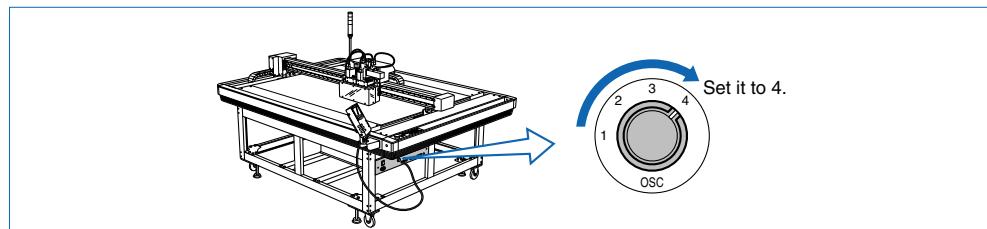
Raise the oscillation unit blade tip.



Remove the medium, use the vacuum pump to secure the felt cutting mat, and adjust the blade tip so that it will cut to approximately 1.5 to 2 mm into the medium surface (half the triangular portion of the blade tip) when down.

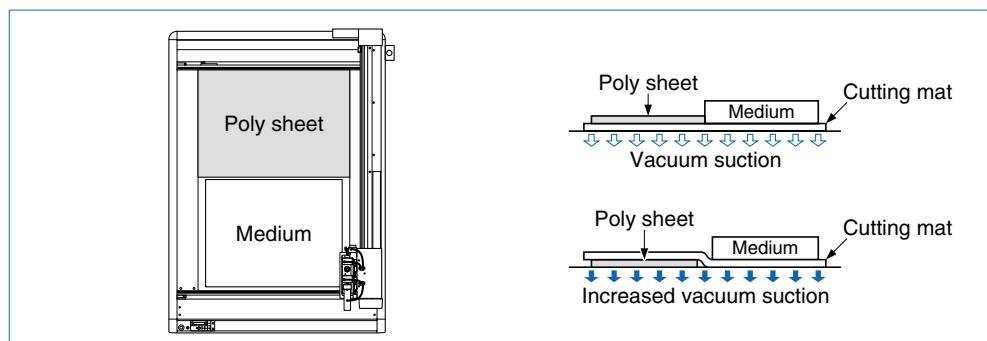
Specify a maximum cutting force of $P = 100$.

11. Turn the OSC control dial to 4.



12. Load the medium. (See section 2.12 "Loading the Medium".)

Turn off the FC3600. After loading the medium, turn on the vacuum pump to secure it. After confirming that the medium is firmly secured and will resist moving when subjected to the cutting force, turn on the FC3600. Be careful at this point, since media that are not firmly secured may cause accidents, such as broken blades. To cover the bare areas outside the media area, use a commercially available poly sheet. Vacuum suction can be enhanced by laying the poly sheet under the felt below the bare areas. If the medium is too small to be held by the vacuum and cannot be affixed, cover the medium with a poly sheet. **Be sure to confirm that media are secured each time cutting is performed.**



CHECKPOINT

When affixing the medium, check which surface is the warping surface and load it as shown below. The suction power varies depending on the direction of the warping.



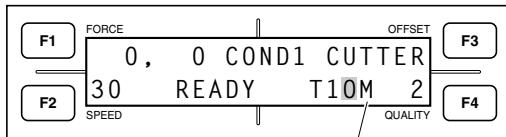
13. Complete the Perforation settings. (See section 4.25 “Setting Perforation”.) For soft media such as urethane foam, specify $U = 0$ so that work proceeds with a pause for each cut segment.

- Access C LINE PAT. in MENU mode.
- Specify $C = 0.5$ and $U = 0$ mm.

CHECKPOINT

Specify the value for C best suited to the various conditions, such as the medium to be cut and the cutting data.

- When CUT LINE is selected, M will be shown on the READY status display.



PERFORATION mode is indicated here by an “M”.

- Access CUT WAIT SETTING in MENU mode. Specify the pause period during perforation cutting.
- Specify CUT WAIT SETTING = 100 msec.

(See page 4-3 “Settings Tool-Down Standby Time”.)

CHECKPOINT

Use the setting values best suited to the various conditions, such as the medium to be cut and the cutting data.

14. Specify the offset angle. (See section 4.21 “Specifying Offset Angle”.)

- Access OFST ANG in MENU mode.
- Specify ANGLE1 = 8° .
- Specify ANGLE2 = 2° , L1 = 1 mm, and L2 = 4 mm.

CHECKPOINT

Use the setting values best suited to the various conditions, such as the medium to be cut and the cutting data.

15. Specify repeat cutting and the number of cuts. (See section 4.14 “Setting Cutting Conditions in THICK Mode”.)

- Access THICK in MENU mode.
- Specify the COND No. for which THICK settings are to be activated.
- Select ALL or LINE.
- Specify the number of cuts: 1

16. Specify the blade tip position offset. (Use the same medium as prepared in step 10.)

(See section 4.3 “Correcting the Blade Tip Position”.)

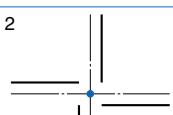
- Access ADJ. R in MENU mode.
- Enter offset values of $X = 0.3$ and $Y = 0.0$, then press the **TEST** key to cut the “+” symbol.
- If the results of cutting match Figure 1, enter a smaller value for Y. If the results match Figure 2, enter a larger value for Y. Continue adjusting the Y offset value until the results match Figure 3.

Figure 1



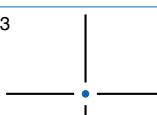
Enter a smaller offset value for Y.

Figure 2



Enter a larger offset value for Y.

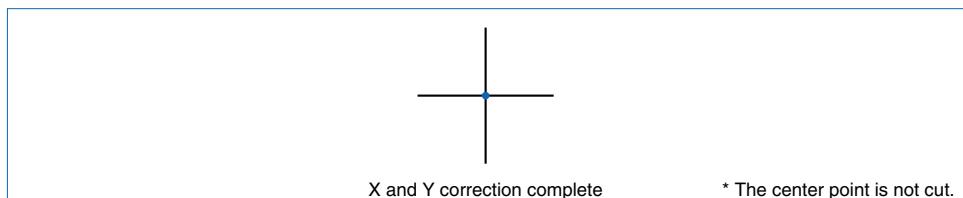
Figure 3



Y correction complete

* The center point and dashed lines indicating correct positions are not actually cut.

- Upon completion of Y correction, enter a smaller offset value for X and repeat the correction process until the results match the figure shown below.

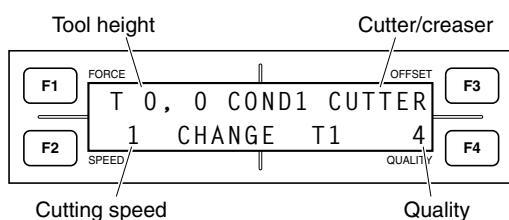


CHECKPOINT

- Mark the "+" symbol near the position (X-Y) used in the Top setting, as described in step 10 of the tool height adjustment in the cutting conditions.
- If the "+" symbol is not marked clearly, the Top setting in step 10 of the tool height adjustment in the cutting conditions may be too high. Specify a different value.

17. Specify the actual tool height for cutting urethane foam.

(See section 3.5 "Specifying Conditions When the Tangential Head is Selected.)



- Tool Height and Cutting Force settings**

Top setting

Lower the oscillation unit blade tip.

Using the vacuum pump to secure the felt cutting mat, adjust the blade tip height to match the medium thickness.

Bottom setting

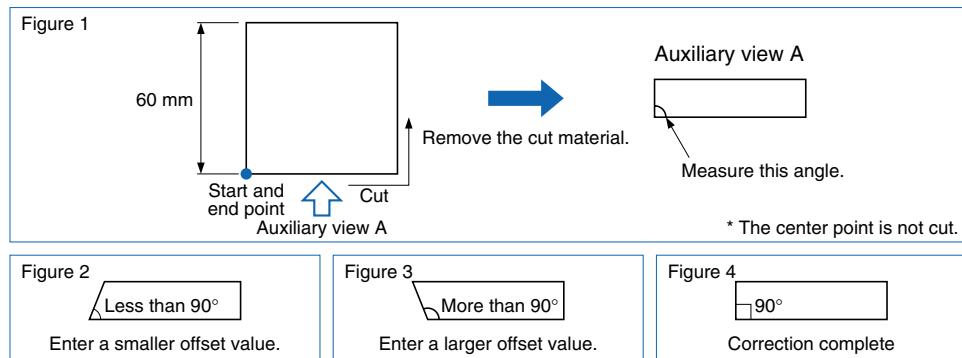
Raise the oscillation unit blade tip. Remove the urethane foam, use the vacuum pump to secure the felt cutting mat, and adjust the blade tip so that it will cut to approximately 1.5 to 2 mm into the medium surface (half the triangular portion of the blade tip).

18. Load the urethane foam. (See section 2.12 "Loading the Medium".)

Turn off the FC3600. After loading the medium, turn on the vacuum pump to secure it. After confirming that the medium is firmly secured and will resist moving when subjected to the cutting force, turn on the FC3600. Be careful at this point, since media that are not firmly secured may cause accidents, such as broken blades. Because urethane foam is a porous material through which air can pass, cover it with a commercially available poly sheet to secure it. To cover the bare areas outside the media area, use a commercially available poly sheet. Vacuum suction can be enhanced by laying the poly sheet under the felt below the bare areas. If the medium is too small to be held by the vacuum and cannot be affixed, cover the medium with a poly sheet. Be sure to confirm that media are secured each time cutting is performed.

19. Specify the blade tip orientation offset. (See section 4.4 "Correcting the Blade Tip Orientation".)

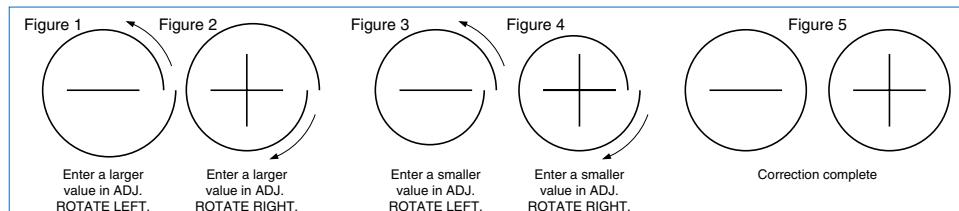
- Access T.DIR in MENU mode.
- After pressing the **▲ TEST key** to display the menu for test cutting selection, select CIRCLE to start the cutting.
- Remove the medium cut as shown in Figure 1, and measure the side angles. If the results of cutting match Figure 2, enter a smaller offset value. If the results match Figure 3, enter a larger value. Continue adjusting the offset until the results match Figure 4.



CHECKPOINT Use a drafting triangle to confirm that an angle is perpendicular.

20. Specify the circular offset. (See section 4.5 "Correcting circles".)

- Access ADJ.C in MENU mode.
- Press the **F4** key (ADJ. R) and the **▲ TEST** key to display the menu for test cutting selection. Next, press the **F2** key (CIRCLE) to cut two circles with different rotation directions (clockwise and counterclockwise). The circle indicated by the minus sign is cut counterclockwise, and the circle indicated by the plus sign is cut clockwise.
- COUNTERCLOCKWISE ADJUSTMENT**
If the cutting results match Figure 1, enter a larger value in ADJ. ROTATE LEFT area. If the cutting results match Figure 3, enter a smaller value. Repeat the correction process until the results match Figure 5. Aim for incremental corrections of 25% to 30% until the points are nearly aligned, then perform fine-tuning by entering corrective values in 1% increments.
- CLOCKWISE ADJUSTMENT**
If the cutting results match Figure 2, enter a larger value in ADJ. ROTATE RIGHT area. If the cutting results match Figure 4, enter a smaller value. Repeat the correction process until the results match Figure 5. Aim for incremental corrections of 25% to 30% until the points are nearly aligned, then perform fine-tuning by entering corrective values in 1% increments.



CHECKPOINT In some cases, the cutting results will be a combination of 1 and 4, or 2 and 3.

These settings are now complete.

CAUTION Be sure to turn on the vacuum pump before cutting.

6

USING THE SPECIAL FUNCTIONS

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6.2	Specifying Special Functions	6-4

6.1 Description of the Special Functions

The FC3600 is equipped with the following special functions. Use the functions in the special situations described below, but note that they are not used in regular cutting operations.

■ Enabling or Disabling the “:” and “;” Commands (available in GP-GL command mode)

When the Command setting is GP-GL, this function enables or disables “:” and “;” commands. If the FC3600 fails to receive the first part of transmitted data, the problem might be attributable to these commands. In such cases, change this setting to DISABLED.

(Default setting: ENABLED)

■ Moving the Pen While Raised or Lowered after the “W” Command is Sent (available in GP-GL command mode)

After receipt of the GP-GL “W” command for the creation of a circle or arc, this function determines how the pen is moved (raised or in the existing state) to the specified starting position. When TOOL DOWN is selected, the pen is moved to the starting position for drawing in the state (raised or lowered) before receipt of the “W” command. When TOOL UP is selected, the pen is moved to the starting position for drawing while raised. This setting is available if the cutter blade is selected in the cutter pen conditions.

(Default setting: TOOL UP)

■ Model Emulated ID Response (available in HP-GL command mode)

When the Command setting is HP-GL, this function determines the FC3600 response to the “OI” command. When 7550 is selected, the OI command response is 7550B. When 7595 is selected, the OI command response is 7595A.

(Default setting: 7550)

■ Selecting the Condition Priority

This function determines whether the FC3600 places priority on programmed cutting conditions from the computer or manually set conditions from the control panel. When MANUAL is selected, cutting is performed based on cutting conditions from the control panel, while those sent from the computer are disregarded. PROGRAM specifies that cutting be performed based on commands as they are received. If no commands are received, cutting is performed according to the cutting details specified on the control panel.

(Default setting: MANUAL)

■ Enabling or Disabling Tool Switching

This function activates and deactivates commands for switching tools (for GP-GL: J and for HP-GL: SP). When ENABLED is specified, the FC3600 switches condition numbers based on the parameters of pen switching commands. When DISABLED is specified, pen switching commands are disregarded.

(Default setting: ENABLED)

■ Setting the Position for Initial Blade Tip

After the FC3600 is turned on or the Condition settings are changed, the cutter pen blade is positioned on the medium to adjust the blade tip orientation. This position is referred to as the “initial blade control.” Thus, this function specifies the position for initial blade control. When 2 mm BELOW is specified, initial blade control is performed 2 mm below the cutting start point. When OUTSIDE is selected, initial blade control is performed outside the effective Cutting/Plotting area.

(Default setting: 2mm BELOW)

■ Enabling or Disabling Tool Up Move

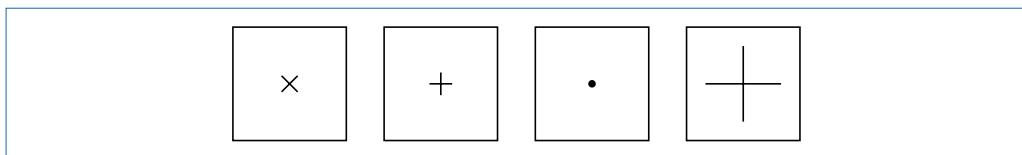
When the FC3600 receives a series of commands specifying movement while the tool is raised, this function determines whether the tool will move through each coordinate or directly from the initial to the final coordinate. When ENABLED is selected, the tool moves through each coordinate consecutively. When DISABLED is selected, the tool moves directly to the last coordinate.

(Default setting: DISABLED)

■ CCD Camera Positioning (available only with the optional CCD camera)

Different symbols can be specified for use in alignment of the CCD camera. Choose from the following four symbols.

(Default setting: +)



■ Enabling or Disabling the Movement Warning Message

You can specify whether the FC3600 will display a warning message for three seconds before movement starts.

(Default setting: ON)

■ Enabling or Disabling the Beeper

This setting activates or deactivates the warning beeper on the FC3600 and status indicator. The MAIN setting applies to the FC3600, and OPTION applies to the status indicator.

(Default setting: ON)

■ Tool Block Setting

This function specifies control of the oscillation motor.

(Default setting: CUTTER)

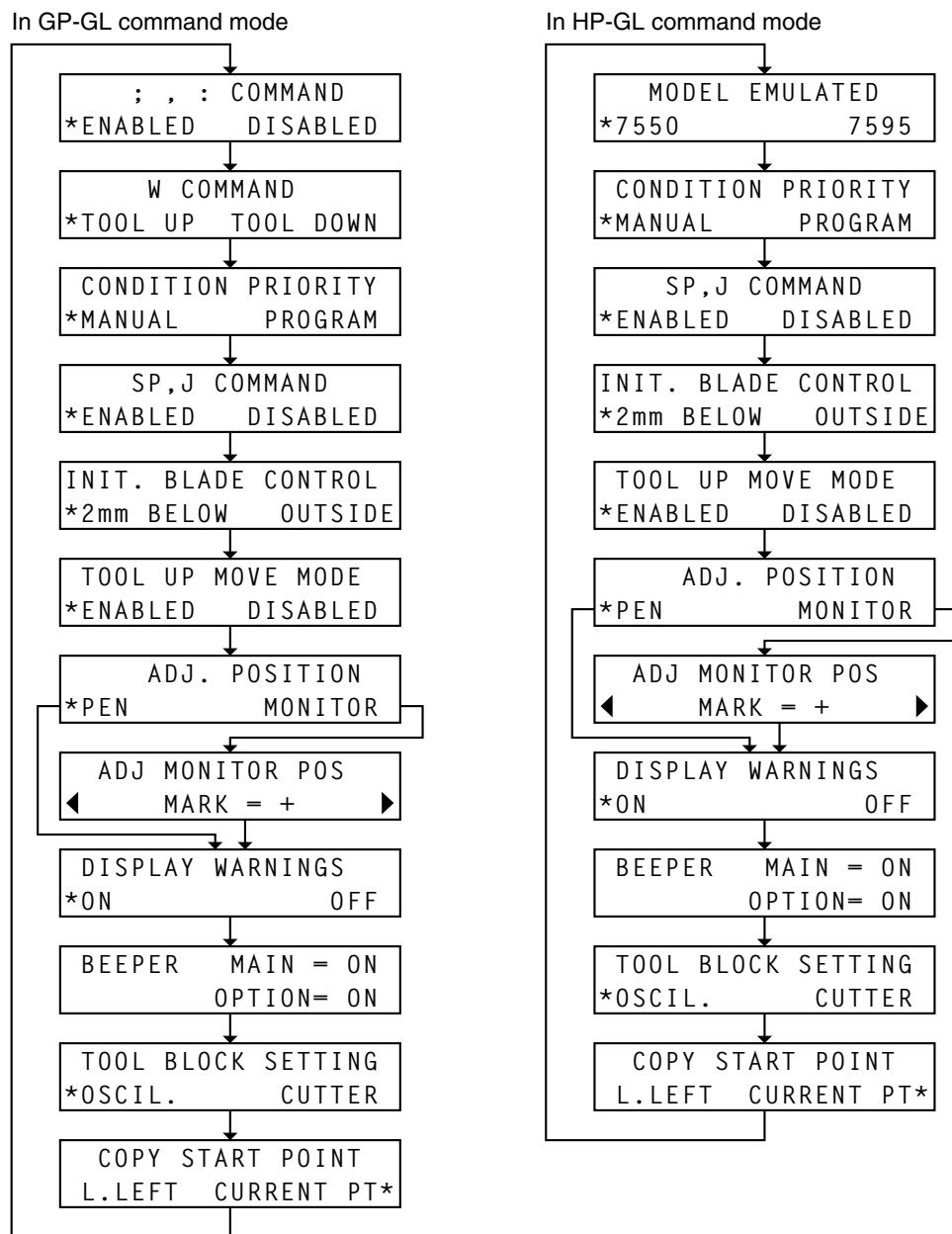
■ COPY-Mode Initial Position Setting

Specifies the starting point for work in COPY mode

(Default setting: CURRENT PT)

6.2 Specifying Special Functions

1. Press and hold the **POSITION** key while turning the FC3600 on to display the special functions menu. To access each menu, press the **NEXT PAGE** key.



2. In each menu, the currently selected setting is indicated by an **asterisk (*)**. Press the **F2** or **F4** key to select the desired menu. Press the **ENTER** key to confirm your choice. In the ADJ MONITOR POS menu, use the **F2** or **F4** key to scroll the mark for selection. After using the **POSITION** keys to adjust the position, press the **ENTER** key to confirm your choice. For the BEEPER setting, use the **F3** or **F4** key to select ON or OFF, respectively, then press the **ENTER** key to confirm your choice. To cancel setup, press the **NEXT PAGE** key. This lets you skip to the next menu.
3. Upon completion of the Special Function settings, turn off the FC3600.



These settings will be stored in memory even when the FC3600 is off.

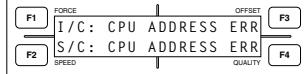
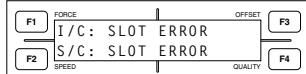
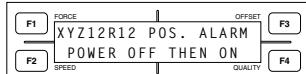
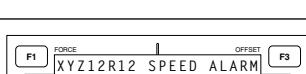
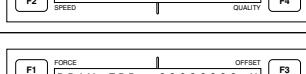
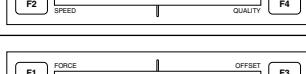
7

TROUBLESHOOTING

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7.2	Q&A	7-5

7.1 List of Error Messages

■ General errors

Error message	Cause	Solution
	Vector table error Damage to the electrical system	Contact your sales representative or nearest Graphtec vendor.
	Address error Damage to the electrical system	Contact your sales representative or nearest Graphtec vendor.
	DMA transmission error Damage to the electrical system	Contact your sales representative or nearest Graphtec vendor.
	Command error Damage to the electrical system	Contact your sales representative or nearest Graphtec vendor.
	Command error Damage to the electrical system	Contact your sales representative or nearest Graphtec vendor.
	Position alarm (abnormal position detected) Excessive load on motor Damage to the electrical system	Remove the source of interference. Contact your sales representative or nearest Graphtec vendor.
	Speed alarm (abnormal speed change detected) Excessive load on motor Damage to the electrical system	Remove the source of interference. Contact your sales representative or nearest Graphtec vendor.
	SRAM error Memory error Damage to the electrical system	Contact your sales representative or nearest Graphtec vendor.
	DRAM error I/O memory error Damage to the electrical system	Contact your sales representative or nearest Graphtec vendor.
	Current limit Excessive current being supplied to the motor Excessive load on motor	Remove the source of interference. Contact your sales representative or nearest Graphtec vendor.

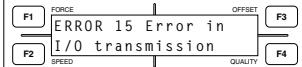
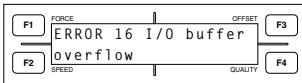
■ Interface errors

In GP-GL command mode

Error message	Cause	Solution
	Command error Code of 0x60 to 0x7e was received as command characters.	Check the commands and communication conditions.
	Parameter overflow The parameter range was exceeded.	Check the commands and communication conditions.
	I/O error Indicates an error related to the reception of data via the interface. The parity does not match.	Check the commands and communication conditions.

In HP-GL command mode

Error message	Cause	Solution
	Command error An unrecognizable command was issued.	Check the commands and communication conditions.
	Parameter error The number of parameters is incorrect.	Check the commands and communication conditions.
	Parameter overflow Unsupported parameters were issued.	Check the commands and communication conditions.
	Character set error An unsupported character set was used.	Check the commands and communication conditions.
	Position overflow The coordinate data exceeds the effective work area.	Check the commands and communication conditions.
	Buffer overflow The data cannot be stored in the memory buffer.	Check the commands and communication conditions.
	During execution of an output command, another output command was received.	Check the commands and communication conditions.
	The ESC character was followed by an invalid byte.	Check the commands and communication conditions.
	A device control command containing an invalid byte was received.	Check the commands and communication conditions.
	A parameter exceeding the permissible range was received.	Check the commands and communication conditions.
	Too many parameters were received.	Check the commands and communication conditions.

Error message	Cause	Solution
 <p>The message displays 'ERROR 15' in the center. Above it, 'FORCE' is on the left and 'OFFSET' is on the right. Below it, 'I/O transmission' is centered. On the left, 'F1' is above 'F2' with 'SPEED' below. On the right, 'F3' is above 'F4' with 'QUALITY' below.</p>	A framing error, parity error, or overrun error occurred.	Check the communication conditions.
 <p>The message displays 'ERROR 16' in the center. Above it, 'FORCE' is on the left and 'OFFSET' is on the right. Below it, 'I/O buffer overflow' is centered. On the left, 'F1' is above 'F2' with 'SPEED' below. On the right, 'F3' is above 'F4' with 'QUALITY' below.</p>	The data could not be stored in the I/O buffer.	Check the communication conditions.

7.2 Q&A

Q1. What should I do when the cutting sample moves out of position?

- A1. When cutting a doughnut-shaped figure, prepare the cutting data so that the inner circle is cut before the outer one.
- A2. Specify SPD=R. (See p. 4-5 "Setting Tool-Up Speed".)
- A3. Use the optional material hold-down attachments.

Q2. How can I increase the media suction (when I use the felt cutting mat)?

- A1. When using media 1 m in width, spread a poly sheet under the felt outside the edge of the media.
- A2. When using small pieces of media, cover the entire surface of the felt (over the top of the medium) with a poly sheet.
- * Be sure to confirm that the medium is secured prior to cutting. If these two solutions do not help to secure it, cutting should not be performed, as doing so would be dangerous.

Q3. Can I cut media with glue or double-sided tape on it?

- A1. The glue will stick to the blade and reduce cutting effectiveness. Avoid cutting such types of media.

Q4. Can I cut media edges?

- A1. Cutting from the outer edge into the media may lead to problems such as broken blades, so avoid this kind of cutting. When cutting parallel to the edge, leave at least 30 mm from the edge. Be particularly careful when cutting soft material such as urethane foam.

Q5. Is it possible to cut media that is 10 mm in thickness (such as styrene board) with the CB30U-OS40?

- A1. No. Use the CB30U-OS20 instead.

APPENDIX

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Appendix C	External Dimensions	A-6

Appendix A Standard Specifications

■ FC3600 Specifications

Item	FC3600-120
Control	X/Y drive system
	Z-axis
	R-axis
Maximum cutting area	X, Y
	Z
Loadable media width	1,400 mm (Y-axis direction)
Plotting/cutting force	Plotter pen
	Cutter pen
	Tool holder
	Oscillation
	Creasing tool
Head *1	T (2P)
	TT (3P)
	O (2P)
	OT (3P)
Media-securing system	Vacuum/tape affixing
Maximum cutting speed	600 m/s
Precision *2	Distance precision
	Repeatability precision
	Perpendicular precision
Internal memory	2 MB
Interfaces	RS-232C, Centronics, and USB (ver 1.1)
Bundled software	Windows driver, plug-in (Win/Mac), and CAD utility
Power supply	100 to 120, 200 to 240 V AC, 50/60 Hz
Power consumption	300 VA or less
Environmental conditions	Operating environment
	Guaranteed precision
External dimensions	1,570 mm (W) x 2,188 mm (D) x 1,145 mm (H) 1,622 mm (W) x 2,188 mm (D) x 1,277 mm (H) (including status indicator)
Weight	Approx. 250 kg (including stand)

*1: The pen holder supports the plotter pen or cutter pen. The tool holder supports fixed-blade cutting or use of the creasing tool.

*2: As verified under Graphtec-designated conditions

■ Supported Media for Cutting

Item	Specifications
Styrofoam	Expansion ratio 60:1 (t = 30 mm)
Urethane foam	Inoac (ESC: density 0.022) (t = 30 mm)
Styrene board	JSP (KP panel) (t = 25 mm)
Polypropylene (PP)	Shin-Kobe Electric Machinery (t = 1 mm)
Polycarbonate (PC)	Takiron (PC1600) (t = 1 mm)
Polyethylene Terephthalate (PET)	Tsutsunaka Plastic (EPG-100) (t = 1 mm)
Polyvinyl Chloride (PVC)	Mitsubishi Plastics (Gray: HP-101E) (t = 1 mm)
Cardboard	Nippon Daishowa Paperboard (PAC) (t = 1.6 mm)
Leather	Cowhide (t = 2.4 mm)
Rubber	Tigers Polymer (CR-L-65°) (t = 7 mm)

Appendix B Options and Supplies

■ Options

Item	Part name	Specifications
Hold-down attachments	SQG-001-LB	Hold-down attachment L (with spring)
	SQG-001-SB	Hold-down attachment S (with spring)
	SQG-001-L	Hold-down attachment L (no spring)
	SQG-001-S	Hold-down attachment S (no spring)
Roll material supply rack	RSK0009	Width: 1,400 mm; Supported load: 20 kg
CCD camera set	CU0002	CCD camera and monitor set
Remote control	RB0005	Remote control for positioning

■ Supplies

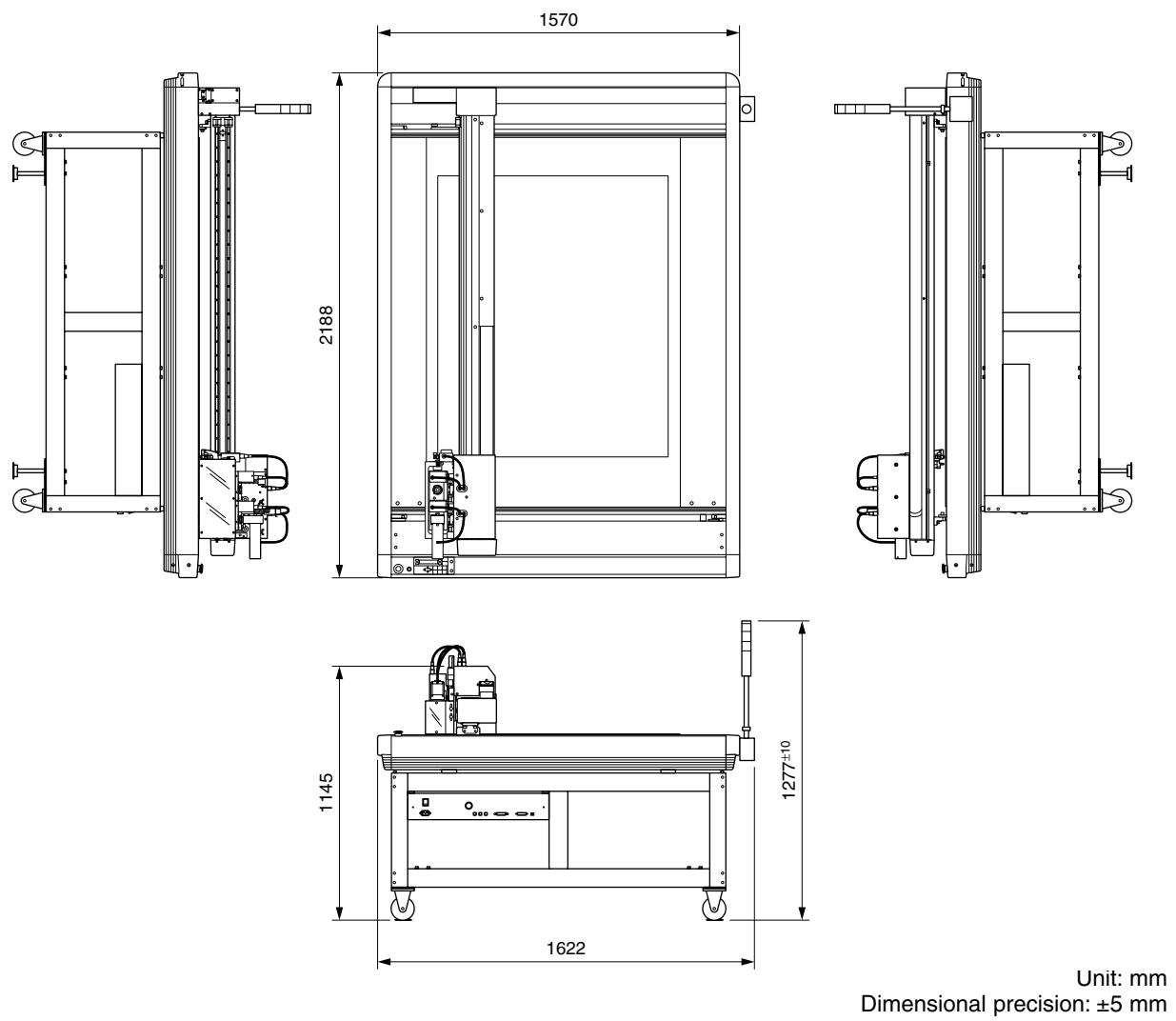
Item	Part name	Specifications
Tool holder	THD-001	
Blade holders	BHD-XB57	For XB57 (for use with the tool holder)
	BHD-XB157T	For XB157-T (for use with the tool holder)
	BHD-BSB13P	For BSB-13P (for use with the tool holder)
	BHD-OS20	For CB30U-OS20 (for use with the oscillation unit)
	BHD-OS40	For CB30U-OS40 (for use with the oscillation unit)
Creasing-tool holders	CHD-005	0.5 mm creasing width
	CHD-010	1.0 mm creasing width
Cutter pens	PHP32-CB09N	Holder for 0.9 mm diam. supersteel blades, one pen
	PHP32-CB15N	Holder for 1.5 mm diam. supersteel blades, one pen
Blade-holder cutter blades	XB57	15 blades/set
	XB157T	5 blades/set
	BSB-13P	1 blade/set
	CB30U-OS20	1 blade/set (for oscillation)
	CB30U-OS40	1 blade/set (for oscillation)
Cutter pen blades	CB09UA-5	Supersteel blade 0.9 mm in diam., 5 blades/set
	CB15U-5	Supersteel blade 1.5 mm in diam., 5 blades/set
Water-based fiber pens	KF550-F8	1 pen each of red, black, violet, brown, blue, green, orange, and pink
	KF550-S1	2 black pens and 1 pen each of red, blue, and green
	KF551-RD	5 red pens
	KF552-BK	5 black pens
	KF555-BL	5 blue pens
	KF556-GR	5 green pens

* Other single-color sets and sets of intermediate shades are available, such as violet, brown, orange, and pink.

Item	Part name	Specifications
Writing panels (cutting mats)	WBD-P ^{*1}	For use with plotter pens and cutting PVC sheets with the cutter pen
	WBD-S	For use with fixed blades (tangential head; 2 mats included)
	WBD-F	For use with the oscillation unit
	AST-50-54	Application sheet (500 mm x 545 mm; 6 sheets included)

*1: Use a combination of WBD-P and WBD-F as a writing panel for pen plotting and cutting PVC sheets with the cutter pen.

Appendix C External Dimensions



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The specifications, etc., in this manual are
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